OSHA Directives

CPL 2-2.45A - Process Safety Management of Highly Hazardous Chemicals-- Compliance Guidelines and Enforcement Procedures.

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- **Directive Number:** CPL 2-2.45A
- **Subject:** Process Safety Management of Highly Hazardous Chemicals-- Compliance Guidelines and Enforcement Procedures.
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OSHA Instruction CPL 2-2.45A
September 28, 1992
Directorate of Compliance Programs

Subject: 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals-- Compliance Guidelines and Enforcement Procedures

A. **Purpose**. This instruction establishes uniform policies, procedures, standard clarifications, and compliance guidance for enforcement of the standard for Process Safety Management of Highly Hazardous Chemicals, 29 CFR 1910.119 ("PSM standard"), and amendments to the standard for Explosives and Blasting Agents, 29 CFR 1910.109.

B. **Scope**. This instruction applies OSHA-wide.

C. **References**.

1. 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals; Final Rule; February 24, 1992, **Federal Register** Vol. 57, No. 36, pp. 6356-6417.

2. OSHA Instruction CPL 2.45B, June 15, 1989, the Field Operations Manual (FOM).

3. OSHA Instruction STP 2.22A, CH-2, January 29, 1990, State Plan Policies and Procedures Manual.

4. OSHA Instruction CPL 2.94, July 22, 1991, OSHA Response to Significant Events of Potentially Catastrophic Consequence.

5. OSHA Instruction ADM 1-1.12B, December 29, 1989, Integrated Management Information System (IMIS) Forms Manual.

D. **Cancellation**. This instruction cancels:

1. OSHA Instruction CPL 2-2.45, September 6, 1988, Systems Safety Evaluation of Operations with Catastrophic Potential.

2. OSHA Notice CPL 2, March 9, 1992, Special Emphasis Program in Petrochemical Industries, Standard Industrial Classification (SIC) Codes 2821, 2869, and 2911.

E. **Action**. OSHA Regional Administrators and Area Directors shall ensure that all compliance and enforcement activities related to the PSM standard adhere to the guidelines of this instruction.

F. **Federal Program Change**. This instruction describes a Federal program change which affects State programs. Each Regional Administrator shall:

1. Ensure that a copy of this change is promptly forwarded to each State designee, using a format consistent with the Plan Change Two-Way Memorandum in Appendix P of OSHA Instruction STP 2.22A, CH-3.

2. Explain the technical content of this change to the State designees as requested.

3. Advise the State designees that, in order to ensure uniform enforcement of the Explosives and Blasting Agents Standard and the Process Safety Management of Highly Hazardous Chemicals Standard addressed by this instruction, State implementation of the procedures in this instruction, or comparable State procedures, must be carefully coordinated with OSHA.

4. Coordinate with the State to ensure appropriate staff training (as discussed at I.4. of this instruction), participation in the Program-Quality-Verification inspection scheduling process (as discussed at J.3.d. of this instruction), and to provide appropriate technical assistance.

5. Ensure that State designees are asked to acknowledge receipt of this Federal program change in writing to the Regional Administrator as soon as the State's intention is known, but not later than 70 calendar days after the date of issuance (10 days for mailing and 60 days for response). This acknowledgment must include the State's intention to follow OSHA's policies and procedures described in this instruction, or a description of the State's alternative policy and/or procedure which is "at least as effective" as the Federal policy and/or procedure.

6. Ensure that the State designees submit a plan supplement, in accordance with OSHA Instruction STP 2.22A, CH-2, as appropriate, following the established schedule that is agreed upon by the State and the Regional Administrator to submit non-Field Operations Manual/Technical Manual Federal Program Changes.

a. If the State intends to follow the revised inspection procedures described in this instruction, the State must submit either a revised version of this instruction, adapted as appropriate to reference State law, regulations and administrative structure, or a cover sheet

describing how references in this instruction correspond to the State's structure. The State's acknowledgment letter may fulfill the plan supplement requirement if the appropriate documentation is provided.

b. If the State adopts an alternative to Federal enforcement inspection procedures, the State's plan supplement must identify and provide a rationale for all substantial differences from Federal procedures in order for OSHA to judge whether a different State procedure is as effective as the comparable procedure.

7. After Regional review of the State plan supplement and resolution of any comments thereon, forward the State submission to the National Office in accordance with established procedures. The Regional Administrator shall provide a judgment on the relative effectiveness of each substantial difference in the State plan change and an overall assessment thereon with a recommendation for approval or disapproval by the Assistant Secretary.

8. Review policies, instructions, and guidelines issued by the States to determine that this change has been communicated to State program personnel.

G. **Backgrond**. On February 24, 1992, OSHA promulgated the Final Rule for Process Safety Management of Highly Hazardous Chemicals. This standard originally became effective on May 26, 1992. An administrative stay delayed the effective date of paragraphs (f), (h), (j), and (l) until August 26, 1992. That stay has expired and the stayed provisions are now fully effective.

1. In recent years, a number of catastrophic accidents in the chemical industry have drawn attention to the safety of processes involving highly hazardous chemicals. OSHA has determined that employees have been and continue to be exposed in their workplaces to the hazards of releases of highly hazardous chemicals which may be toxic, reactive, flammable, or explosive.

2. The requirements of the PSM standard are intended to eliminate or mitigate the consequences of such releases. The standard emphasizes the application of management controls when addressing the risks associated with handling or working near hazardous chemicals.

3. In addition, the PSM standard has been developed in fulfillment of OSHA's obligation under the Clean Air Act Amendments (CAAA) of 1990, section 304(a). The final rule is consistent with the mandate of the CAAA.

4. It is anticipated that joint inspection activities related to the PSM standard will arise between OSHA, the Environmental Protection Agency, and the Chemical Safety and Hazard Investigation Board, which was mandated by the CAAA.

H. **Enforcement Activity Related to the PSM Standard--Types of Inspections**. 29 CFR 1910.119 has broad applicability to potentially hazardous processes that may exist in a wide

variety of industries. Accordingly, enforcement activities related to the PSM standard--either to determine if an employer is covered by the standard or to assess the employer's compliance with it--may take place in any of the inspection types described below. The following guidelines shall apply to PSM-related compliance activity:

1. **Program-Quality-Verification (PQV) Inspections**. The primary enforcement model for the PSM standard shall be the PQV inspection, as described at K. and L. of this instruction. Programmed PQV inspections shall be scheduled as described at J. of this instruction.

2. **Other Programmed Inspections: Screening for PSM Coverage.** In all programmed safety and health inspections in general industry, a determination shall be made as to whether the establishment is covered by the PSM standard.

a. This determination shall follow the criteria presented at 29 CFR 1910.119(a), including appropriate reference to Appendix A of 1910.119. The determination may be made in conjunction with an assessment of the employer's Hazard Communication program.

b. If the establishment is found to be covered by the standard:

(1) It shall be further determined if the establishment is included in the universe of affected establishments from which PQV inspections may be scheduled. (See J. of this instruction.)

(2) The employer shall be provided:

(a) Copies of the OSHA publications "Process Safety Management," OSHA Publication 3132, which also contains the full text of 1910.119; and "Process Safety Management--Guidelines for Compliance;" and

(b) A letter notifying the employer that the subject establishment is covered by the PSM standard and may be inspected under the standard. The letter shall also emphasize the employer's obligation to comply with the standard. An example of such a letter is provided as Appendix F of this instruction.

c. The Area Director shall ensure proper coding of the OSHA-1 (as described at Q. and Appendix H of this instruction) to identify the establishment as either known to be covered by the PSM standard or known not to be covered by the standard.

3. **Unprogrammed PSM-related Inspections**. In all unprogrammed inspection activity relating to the PSM standard, a determination shall be made as to whether the establishment is covered by 29 CFR 1910.119.

a. If a formal complaint or referral relating to the PSM standard is received regarding any workplace classified in one of the SIC codes listed at Appendix C of this instruction, the complaint or referral item(s) shall be investigated and:

(1) All programs required by the PSM standard shall be screened for obvious violations; and

(2) A CSHO referral for a PQV inspection shall be considered if major deficiencies are indicated. This determination shall be documented in the case file.

b. Investigations of formal, PSM-related complaints and referrals in establishments in all other SIC codes shall normally be limited to the complaint item(s) only, unless violations related to the complaint or referral items are found.

4. **Responses to Accidents and Catastrophes**. Responses to accidents and catastrophes involving PSM shall follow the guidelines contained in Chapter VIII of the FOM and--where appropriate--in OSHA Instruction CPL 2.94, "OSHA Response to Significant Events of Potentially Catastrophic Consequence," in addition to the guidelines of this instruction. If the workplace is classified in one of the SIC codes listed at Appendix C of this instruction, a PQV inspection shall be considered; the reasons for the determination shall be documented in the case file.

5. **All Other Inspections**. Normally, there shall be no PSM-related activity on any inspection other than those described at H.1. through H.4., above.

I. **Inspection Resources**. Appropriate levels of staff training and preparation are essential for compliance activities relating to the PSM standard. In particular, it is anticipated that PQV inspections will be highly resource-intensive; they will therefore require careful planning and coordination. The recommendations included as Appendix G of this instruction may be used as a guide for such planning.

1. **PQV Team Leaders ("Level One")**. Only trained compliance safety and health officers (CSHOs) with experience in the chemical industry (and/or the explosives industry, as appropriate) shall be assigned to lead a PQV inspection under this standard.

a. As a minimum, this training must include the OSHA Training Institute's Course 330, "Safety and Health in the Chemical Processing Industries," and Course 340, "Hazard Analysis in the Chemical Processing Industries." A section of Course 340 will deal with explosives manufacture.

NOTE: (1) Due to a significant change in course content, completion of Course 330 prior to Fiscal Year 1991 does not meet this requirement for PQV team leaders.

(2) All CSHOs who will serve as PQV team leaders should have additional advanced training such as that offered by the National Institute of Standards and Technology and the U.S. Bureau of Mines.

b. Team leaders must have prior experience in the chemical industry. This experience should include experience obtained from accident/explosion investigations in chemical or

petrochemical plants, through previous chemical inspections involving process safety management evaluation, or through previous chemical industry employment.

c. For PQV inspections of explosives manufacturers, team leaders shall have had experience in the explosives industry.

2. **PQV Team Members ("Level Two")**. CSHOs may be assigned as PQV team members, or to conduct unprogrammed inspections in workplaces in the targeted SIC codes listed in Appendix C of this instruction, if they have 2 years of OSHA inspection experience or the equivalent and have completed Course 330, "Safety and Health in the Chemical Processing Industries" (including offerings of this course prior to Fiscal Year 1991) and Course 340, "Hazard Analysis in the Chemical Processing Industries."

3. **CSHOs With Less Training**. Complaint and other unprogrammed inspections pertaining to some sections of the standard may be conducted by CSHOs who do not have the training and experience described at I.1. or I.2., above, but who are experienced in evaluating other programmatic standards such as hazard communication and lockout/tagout and in evaluating respirator programs.

a. The following sections of 29 CFR 1910.119 may be appropriately evaluated by such CSHOs:

* (c) Employee participation.

* (g) Training.

* (h) Contractors.

* (k) Hot work permits.

* (m) Incident investigation.

* (n) Emergency planning and response.

b. Such CSHOs shall make full utilization of Technical Support resources at the Regional Office and National Office levels in arriving at decisions regarding compliance or noncompliance.

c. Nevertheless, to the extent possible, Area Directors shall attempt to utilize CSHOs with experience and training in the chemical industry to perform such unprogrammed inspections.

4. **State Plan States**. Each State shall have one or more CSHOs trained to meet the requirements for PQV team leaders and an appropriate number of qualified team members.

OSHA will provide technical assistance, as needed, through the Regional Office, Health Response Team, and the Office of Construction and Engineering.

J. **PQV Inspection Scheduling**. Due to the resource-intensive nature of inspections for compliance with the PSM standard, the Agency will be able to perform only a limited number of PQV inspections (as described at K. and L. of this instruction) each year. A special targeting and scheduling system is therefore necessary to maximize the effective use of inspection resources.

1. **Targeting**. OSHA wishes to make the most effective use of its limited resources, and therefore will use the factors listed below in determining the SIC codes to be inspected. OSHA will select the SICs that have experienced the greatest number of accidents/incidents as determined from these three sources:

a. Published insurance industry reports of major accidents/incidents.

b. IMIS data, including the OSHA-170 Investigation Summary File.

c. EPA Accident Release Information Program (ARIP) data.

2. **Current Targeted SICs**. A list of targeted SIC codes based on current data, as described at J.1., is included as Appendix C of this instruction. This Appendix may be updated periodically.

3. **Scheduling**. PQV inspections shall be scheduled as follows:

a. Using the list of SICs determined as described at J.1. above, the Office of Statistics shall annually create an initial list including all known establishments within each of the identified SICs for each Region. This list shall be organized by establishment, by establishment size, by corporate identity (as determined through a commercially available source), and by State.

b. The Directorate of Compliance Programs shall forward the initial lists to the appropriate Regions. A Region may add to its initial list establishments that are known to be in the identified SICs and to have more than 10 employees.

c. Within 30 days of receipt of the initial list, each Region shall select five candidates for a PQV inspection and shall forward the resulting list, together with documentation supporting the selections, to the Directorate of Compliance Programs. The Regions shall base their selection on such factors as:

(1) Number of employees at the facility.

(2) Age of the facility.

(3) Known toxicity of chemicals used in the facility' s processes.

(4) Frequency of media reports of releases or other incidents at the facility.

(5) Local EPA information.

(6) Past OSHA history of the facility, including complaints received and/or followup inspections due.

(7) Information from local/municipal fire departments.

NOTE: The Regions need not make a determination on each of these factors for each establishment on their initial list; however, their selections for candidates shall be thoroughly documented.

d. Beginning with Fiscal Year 1994, Regional Administrators shall provide to each State designee a copy of the establishment list within their State. Each State shall nominate one establishment for a PQV inspection or provide an explanation of why a PQV inspection should not be scheduled in their State. Regional Administrators shall include these candidates with their regional submission (i.e., in addition to the five candidates submitted by each Region) to the Directorate of Compliance Programs, together with their assessment and recommendation as to whether the State's candidate should be included in the national selection and as to the State's degree of readiness to conduct the inspection independently.

e. Within 60 days of the receipt of the candidate lists from the Regions, the Directorate of Compliance Programs shall notify each Region of the final list of establishments from which PQV inspections are to be scheduled.

(1) The selections for the Regional lists shall be made by the Directorate of Compliance Programs in coordination with the Office of Field Programs. The selections shall be based on:

(a) Emphasis on a corporate approach, to give inspection priority to the maximum number of different corporations, rather than targeting multiple inspections in the same corporation; and

(b) Regional resources and inspection goals; and

(c) Overall Agency resources.

(2) Inspection goals (actual numbers) are to be set in the annual Field Operations Program Plan between Regions and the Office of Field Programs.

(3) The number of establishments selected may vary from Region to Region, because OSHA plans to focus more PQV inspections in Regions with higher concentrations of high-hazard industries affected by the standard.

(4) The selections from the States' list shall be coordinated with the Office of State Programs. Regional Administrators shall include full discussion and coordination with the affected States.

4. **Deletion Criteria**. An establishment shall be deleted from the list if it:

a. Has received a substantially complete systems safety inspection or PQV inspection within the current or the preceding 5 calendar years; or

b. Is included in a corporate settlement agreement requiring appropriate management systems for process safety; or

c. Is a VPP participant; or

d. Is a corporate office/headquarters and is not engaged in actual production or physical research operations; or

e. Has been identified in the wrong SIC code or is out of business; or

f. Is not covered because of exclusions in the PSM standard; or

g. Has been the subject of a PSM-related inspection (complaint or referral) in the preceding year during which PSM programs were screened and a referral for a PQV inspection was not made.

NOTE: Determination for deletion shall be made initially, to the extent possible, at the National Office level when the list is prepared; and/or subsequently, as necessary, at the Regional Office level based on local knowledge (e.g., recent inspections, Area Office screening, State Manufacturers' Guide).

5. **Local Emphasis Programs**. Some Regions may have relatively few establishments in the targeted SIC codes listed in Appendix C. Regional Administrators therefore may propose a Local Emphasis Program to direct Regional PSM inspections resources to industry types that may not be covered by the targeted SIC codes. Such Local Emphasis Programs shall be submitted to the Directorate of Compliance Programs for approval in accordance with the FOM, Chapter II.

K. **Scope of PQV Inspection**. Comprehensive inspections under the PSM standard shall evaluate the procedures used by the employer and the process-related contract employers to manage the hazards associated with processes using highly hazardous chemicals. Normally,

these inspections will embody a three-fold approach, which for reference is termed **Program-Quality-Verification** (PQV).

1. First, the employer's and the contract employers' **Program** for complying with each of the listed elements of the PSM standard shall be evaluated in accordance with the PSM Audit Guidelines contained in Appendix A of this instruction. (See also M. of this instruction.)

2. Second, the **Quality** of the employer's and the contract employers' procedures shall be compared to acceptable industry practices as described in the standard to determine compliance.

3. Third, **Verification** of the employer's and the contract employers' effective implementation of the program can be made through review of written programs and records of activity, interviews with employees at different levels, and observation of site conditions. The team leader shall select one or more processes as described at L.7. of this instruction to perform the verification portion of the inspection.

L. **PQV Inspection Procedures**. The procedures given in the FOM, Chapter III, shall be followed except as modified in the following sections:

1. **Opening Conference**. Where appropriate, the facility safety and health director, Process Safety Manager, or other person capable of explaining the company's Process Safety Management Program shall be included in the opening conference.

a. During the opening conference, CSHOs shall familiarize themselves with the establishment's emergency response procedures and emergency alarms.

b. CSHOs shall also request that the management representative(s) provide them with a reasonably detailed overview of the chemical (and, where applicable, explosives) process and/or manufacturing operations at the facility, including block flow and/or process flow diagrams indicating chemicals and processes involved.

2. **PSM Overview**. Prior to beginning the walkaround inspection, the CSHOs shall request an explanation of the company's Process Safety Management Program including, at a minimum:

a. How the elements of the standard are implemented;

b. Personnel designated as responsible for implementation of the various elements of the standard; and

c. A description of company records used to verify compliance with the standard.

3. **Initial Walkaround**. After this familiarization, the inspection may begin with a brief walkaround inspection of those portions of the facility within the scope of the standard.

Additional walkaround activity may be necessary after selection of the process unit(s). The purpose of the initial walkaround is to:

a. Give CSHOs a basic overview of the facility operations;

b. Allow CSHOs to observe potential hazards such as pipework in risk of impact, corroded or leaking equipment, unit or control room siting, and location of relief devices; and

c. Solicit input from the employee representative concerning potential PSM program deficiencies.

4. **Personal Protective Equipment (PPE)**. In addition to normal inspection protective equipment, CSHOs conducting these inspections shall be provided with flame retardant coveralls for protection from flash fires and with NIOSH-approved emergency escape respirators for use during any emergency conditions. PPE shall be appropriate to the environment at the workplace. Special equipment will be necessary in environments containing explosive materials.

a. CSHOs shall wear flame-retardant coveralls in all areas of the plant where there is potential for flash fires and as may be required by company policy.

NOTE: Clothing made of hazardous synthetic fabrics should not be worn underneath flame-retardant coveralls.

b. CSHOs shall carry emergency escape respirators, when necessary, during the walkaround portion(s) of the inspection. CSHOs conducting these inspections shall have received proper training in the use of emergency escape respirators.

c. CSHOs shall be provided with appropriate alert monitors approved for the environment where they will be used (e.g., HCN, Cl2) where such devices are necessary.

d. CSHOs shall ensure that any still cameras and/or video cameras are intrinsically safe for use in the process areas being inspected.

NOTE: CSHOs may use video cameras equipped with a telephoto lens from outside classified areas and/or still cameras without batteries.

5. **Documentation to be Requested--General and Process Related**. At the conclusion of the opening conference, the CSHO shall request access to or copies of the documents listed at L.5.a. through L.5.m. below. Initially, to expedite the inspection process, only access to documents should be requested. During the inspection, as potential violations of the standard are observed, copies of the written documentation described below shall be requested to substantiate citations.

a. OSHA 200 Logs for the past 3 years for both the employer and all process-related contractor employer(s).

b. Employer's written plan of action regarding the implementation of employee participation.

c. Written process safety information for the unit(s) selected (see L.7.), if available, such as flow diagrams, piping and instrumentation diagrams (P&ID's), and process narrative descriptions.

NOTE: The employer is required to compile process safety information on a schedule consistent with the employer's schedule for conducting the process hazard analyses (PHA).

d. Documented priority order and rationale for conducting process hazard analyses; copies of any process hazard analyses performed after May 25, 1987; team members; actions to promptly address findings; written schedules for actions to be completed; documentation of resolution of findings; documentation verifying communication to appropriate personnel; and 5-year revalidation of original PHA required by standard.

e. Written operating procedures for safely conducting activities in each selected unit; annual certification that operating procedures are current and accurate; written procedures describing safe work practices for potentially hazardous operations, including (but not limited to) lockout/tagout, confined space entry, lifting equipment over process lines, capping over ended valves, opening process equipment or piping, excavation, and control over entrance into a facility of maintenance, laboratory, or other support personnel.

f. Training records for initial and refresher training for all employees in the selected unit(s) whose duties involve operating a process; methods for determining the content of the training; methods for determining frequency of refresher training; certification of required knowledge, skills, and abilities to safely perform job for employees already involved in operating a process on May 26, 1992, who have not received initial training; and training material.

g. Pre-startup safety review for new facilities and for modified facilities when the modification is significant enough to require a change in the process safety information; documentation of employee training.

h. Written procedures and schedules to maintain the ongoing integrity of process equipment; the relevant portions of applicable manufacturers' instructions, codes, and standards; and inspection and tests performed on process equipment in the unit(s) selected.

i. Hot work permit program and active permits issued for the unit(s) selected.

j. Written procedures to manage change to process chemicals, technology, equipment and procedures; and changes to facilities that affect a covered process.

k. Incident investigation reports for the unit(s) selected, resolutions and corrective actions.

l. Written emergency action plan including procedures for handling small releases and evidence of compliance with 1910.120(a), (p), and (q), where applicable.

m. The two most recent compliance audit reports, appropriate responses to each of the findings, and verifications that deficiencies have been corrected.

6. **Documentation to be Requested--Contractor-Related**. The following information relating to contractor compliance shall be requested:

a. **Documentation from Employer**:

(1) Information relating to contract employers' safety performance and programs;

(2) Methods of informing contract employers of known potential hazards related to contractor's work and the process and applicable provisions of the emergency action plan;

(3) Safe work practices to control the entrance, presence and exit of contract employers and contract employees in covered process areas;

(4) Evaluation of contractor employer performance in fulfilling responsibilities required by the standard;

(5) Contract employee injury and illness logs related to work in process areas; and

(6) A list of unique hazards presented by contractors' work or hazards found in the workplace that have been reported to the employer.

b. **Documentation from Contract Employer**:

(1) Records showing employees receive training in and understand safe work practices related to the process on or near which they will be working to perform their jobs safely;

(2) Known potential fire, explosion or toxic release hazards related to job, and applicable provisions of emergency action plan; and

(3) A list of unique hazards presented by contractors' work or hazards found in the workplace that have been reported to the employer.

NOTE: The documentation described at L.5. and L.6.a. may also be required of the contract employer, depending on the scope of the contract employer's activities.

7. **Selection of Process(es)**. The team leader shall select one or more processes within which to evaluate compliance with the standard. This selection shall be based on the factors listed below, and shall be documented in the case file:

a. Factors observed during the walkthrough;.

b. Incident reports and other history;

c. Company priorities for or completed process hazard analyses (PHA);

d. Age of the process unit;

e. Nature and quantity of chemicals involved;

f. Employee representative input;

g. Current hot work, equipment replacement, or other maintenance activities; and

h. Number of employees present.

M. **Compliance Guidelines for Specific Provisions of 29 CFR 1910.119**. Guidelines for assessing compliance with the provisions of the PSM standard are provided in Appendix A of this instruction.

1. CSHOs shall use the guidance contained in Appendix A during all enforcement activities related to the PSM standard.

2. Clarifications and interpretations are provided in Appendix B of this instruction. Appendix B (or a subsequent revision) shall normally be the first point of reference in interpreting 29 CFR 1910.119.

NOTE: Appendix B will be updated on an ongoing basis through page changes to this instruction, as more interpretations are developed. CSHOs must therefore take care to ensure that their reference copies are up-to-date.

N. **Citations**. Citations for violations of the PSM standard shall be issued in accordance with the FOM, Chapters IV and V, with the following additional directions:

1. **Classification**. The requirements of the PSM standard are intended to eliminate or mitigate the consequences of releases of highly hazardous chemicals. The provisions of the standard present closely interrelated requirements, emphasizing the application of management controls when addressing the risks associated with handling or working near hazardous chemicals.

a. Any violation of the PSM standard, therefore, is a condition which could result in death or serious physical harm to employees.

b. Accordingly, violations of the PSM standard shall normally not be classified as "other-than-serious."

2. **Use of Appendix A**. Appendix A, PSM Audit Guidelines, is constructed as a series of questions relating to each of the pertinent provisions of the standard.

a. The questions are designed to elicit a determination of "Yes" or "No" by the CSHO as to whether compliance with the provision has been met.

b. A determination of "No" for any provision indicates noncompliance; thus, any "No" shall normally result in a citation for a violation of that provision.

c. The CSHO shall thoroughly document each such determination in the case file.

O. **Non-Mandatory Appendices to this Instruction**. This instruction contains two **non-mandatory** appendices that are designed to provide additional compliance assistance.

1. Appendix E is still being developed and is designated as "Reserved."

2. Appendix G, Recommended Guidelines for PQV Inspection Preparation, is intended as an aid to Regional and Area Offices in planning resources for PQV and other PSM related inspections.

P. **Evaluation**. Each Region shall develop a preliminary evaluation of the effectiveness of this program and submit it to the Directorate of Compliance Programs no later than September 30, 1995. The report shall include, at a minimum, the following items:

1. The utility of the PSM audit guidelines used in Appendix A.

2. An assessment of the accuracy of targeting information.

3. An estimate of total resources (CSHO, supervisory, administrative and legal) that were required to conduct each inspection.

Q. **Recording in IMIS**. Information about PSM-related inspections shall be recorded in IMIS following current instructions given in the IMIS manual. Refer to Appendix H of this instruction for additional guidance.

Joseph A. Dear Assistant Secretary

DISTRIBUTION: National, Regional, and Area Offices All Compliance Officers State Designees NIOSH Regional Program Directors 7(c)(1) Consultation Project Managers OSHA Training Institute

APPENDIX A

PSI AUDIT GUIDELINES

Purpose.

This appendix contains audit guidelines intended to assist the CSHO in investigating an employer's compliance with the PSM standard. It shall be used in conjunction with Appendix B, Clarifications and Interpretations of the PSM Standard, as the primary source of compliance guidance on 29 CFR 1910.119.

Structure.

The guidelines present a Program Summary, Quality Criteria References, and a Verification checklist for each of the PSM elements.

1. Guidelines for paragraphs **c, g, h, k, m,** and **n** are designed so that CSHOs who may not be specifically trained in chemical process plants or in the PSM standard can make a preliminary review of the required elements.

2. Guidelines for elements **d, e, f, i, j, l, o,** and **p** are oriented toward more detailed investigations.

Use of the Verification Checklist.

The verification of each program element is divided into three parts: Records Review, On-Site Conditions and Interviews.

1. The Records Review section describes the documentation of the programs as required by the PSM standard. During a preliminary inspection, the CSHO shall review the documentation for the entire PSM program to ascertain that all of the elements are developed.

2. Sections labeled On-Site Conditions and Interviews guide the CSHO in confirming that the programs are implemented. This confirmation involves observing conditions and procedures, and interviewing the operators, maintenance personnel, engineering support staff, contractors and contractor employees, as appropriate, to determine whether the implemented program matches the program outlined by the documentation.

NOTE: Several questions in the "Interviews" sections refer to interviewing engineers. The PSM standard does not require an employer to employ engineers, and these questions should not be construed as imposing a new requirement that an employer do so. All questions in this

appendix that refer to interviews of engineers shall be understood to mean "engineers, if any, or other qualified persons capable of providing the information requested."

3. The CSHO shall initially perform a representative number of observations and interviews for elements c, g, h, k, m, and n. A more detailed investigation will cover all 14 elements. During these detailed assessments, the CSHO shall review components from a representative number of processes, if multiple processes exist. To confirm implementation, the CSHO shall compare the conditions and the interview results with both the minimum requirements of the PSM standard and the program outlined by the employer's documents.

Audit Guideline Documentation.

As noted at P.2. of the body of this instruction, the Audit Guidelines are constructed as a series of questions relating to each of the pertinent provisions of the standard.

1. The questions are designed to elicit a determination of "Yes" or "No" by the CSHO as to whether compliance with the provision has been met. This shall be indicated in the column labeled Met Y/N. A "Y" or "Yes" in this column indicates the subsection meets requirements. An "N" or "No" indicates the employer does not meet the standard and an "NA" signifies that the subsection does not apply.

2. A determination of "No" for any provision indicates noncompliance; thus, **any "No" shall normally result in a citation for a violation of that provision.**

3. The CSHO shall thoroughly document each such determination in the case file.

The Field Note Reference(s) space is used to cross-reference the PSM subsection with the CSHO's field notes. Field notes need not be rewritten when using these guidelines. The CSHO may record field note page numbers, videotape frame identification, photograph identification, and other documentation that refers to the requirements of the standard's elements.

Basic Audit Information.

In order to gather the information needed to audit the program, the CSHO shall answer the following questions for each element:

Who? What? When? Where? Why? and How?

1. Who are the officials responsible for developing and implementing each of the program elements?

2. What are the requirements and the contents of each program element?

3. When are the required actions for each element completed and when are they required to be completed?

4. Where have actions been implemented or changed?

5. Why have the implementation decisions and priorities been made as recorded in the PSM documentation?

6. How is the program implemented and how is the program's effectiveness evaluated and improved (monitoring performance, followup and closure of outstanding items, etc.)?

Interrelationship of Elements.

An essential part of verifying program implementation is to audit the flow of information and activities among the elements. When information in one element is changed or when action takes place in one element that affects other elements, the CSHO shall review a sample of the related elements to see if the appropriate changes and followup actions have taken place.

The following example demonstrates the interrelationship among the elements:

During a routine inspection of equipment (**Mechanical Integrity**), the maintenance worker discovers a valve that no longer meets the applicable code and must be changed. Because the type of valve is no longer made, a different type of valve must be selected and installed (**Management of Change**). The type of valve selected may mandate different steps for the operators **(Operating Procedures)** who will require training and verification in the new procedures (**Training**). The rationale for selecting the type of valve must be made available for review by employees and their representatives (**Employee Participation**).

When the new valve is installed by the supplier (**Contractors**), it will involve shutting down part of the process (**Pre-startup Safety Review**) as well as brazing some of the lines (**Hot Work Permit**). The employer must review the response plan (**Emergency Planning**) to ensure that procedures are adequate for the installation hazards.

Although **Management of Change** provisions cover interim changes, after the new valve is in place the **Process Safety Information** will have to be updated before the **Process Hazard Analysis** is updated or revalidated, to account for potential hazards associated with the new equipment. Also, inspection and maintenance procedures and training will need to be updated (**Mechanical Integrity**).

In summary, 11 PSM elements can be affected by changing one valve. A CSHO would check a representative number of these 11 elements to confirm that the required followup activities have been implemented for the new valve.

Three key elements shall be routinely reviewed to verify that changes have been implemented. They are:

* Operating Procedures;

* Process Hazard Analysis; and

* Training.

These elements shall be crosschecked to see if they show that the changes have been followed through to completion.

1910.119(c): EMPLOYEE PARTICIPATION

I. PROGRAM SUMMARY

The intent of this paragraph is to require employers to involve employees at an elemental level of the PSM program. Minimum requirements for an Employee Participation Program for PMS must include a written plan of action for implementing employee consultation on the development of process hazard analyses and other elements of process hazard management contained within 1910.119. The employer must also provide ready access to all the information required to be developed under the standard.

II. QUALITY CRITERIA REFERENCES

A. 1910.119(c): Employee Participation

III. VERIFICATION OF PROGRAM ELEMENTS

A. Records Review

1. Does a written program exist regarding employee participation? [Criteria Reference .119(c)(1)]

2. Does the written program include consultation with employees and their representatives on the conduct and development of process hazard analyses and on the development of other elements in the PSM standard? [Criteria Reference .119(c)(2)]

3. Does the written program provide employees (including contractor employees) and their representatives access to process hazard analyses and all other information developed as required by the PSM standard? [Criteria Reference .119(c)(3)]

B. On-site Conditions

Not applicable.

C. Interviews

1. Based on interviews with a representative number of employees and their representatives, have they been consulted on the conduct and development of the process hazard analyses? [Criteria Reference .119(c)(2)]

2. Based on interviews with a representative number of employees and their representatives, have they been consulted on the development of other elements of the Process Safety Management program? [Criteria Reference .119(c)(2)]

3. Based on interviews with a representative number of employees (including contractor employees) and their representatives, have they been informed of their rights of access and provided access to process hazard analyses and to all other information required to be developed by the PSM standard? [Criteria Reference .119(c)(3)]

(Ask about unreasonable delays in access to information and whether time is given during the working hours to access information required by the PSM standard.)

1910.119(d): PROCESS SAFETY INFORMATION

I. PROGRAM SUMMARY

The intent of this paragraph is to provide complete and accurate information concerning the process which is essential for an effective process safety management program and for conducting process hazard analyses. Therefore in accordance with the schedule set forth in paragraph (e)(1) the employer is required to compile written process safety information on process chemicals, process technology, and process equipment before conducting any process hazard analysis.

II. QUALITY CRITERIA REFERENCES

A. 1910.119(d): Process Safety Information B. 1910.119(e)(1): Process Hazard Analysis C. 1910.1200: Hazard Communication

III. VERIFICATION OF PROGRAM ELEMENTS

A. Records Review

1. Has written process safety information been compiled before conducting any process hazard analysis (PHA)? [Criteria Reference .119(d)]

2. Is information included pertaining to the hazards of the highly hazardous chemicals used or produced by the process, and does the information include at least: [Criteria Reference .119(d)(1): .1200(g)]

* toxicity information * PEL's * physical data * reactivity data * corrosivity data * thermal and chemical stability data * hazardous effects of inadvertent mixing of different materials that could foreseeably occur?

NOTE: MSDS's meeting the requirements of 29 CFR 1910.1200(g) may be used to the extent they contain the information required.

3. Is information included concerning the technology of the process, and does it include at least: [Criteria Reference .119(d)(2)]

* a block flow diagram or simplified process flow diagram? * process chemistry? * maximum intended inventory? * safe upper and lower limits? * an evaluation of the consequences of deviations?

(Where the original technical information no longer exists, it may be developed in conjunction with the PHA.)

4. Is information included pertaining to equipment in the process, and does it include at least: [Criteria Reference .119(d)(3)(i)]

* materials of construction? * piping and instrument diagrams (P&iD's)? * electrical classification? * relief system design and design basis? * ventilation system design? * design codes and standards employed? * material and energy balances for processes built after May 26, 1992? * safety systems (e.g. interlocks, detection or suppressions systems)?

5. Has the employer documented that equipment complies with recognized, generally accepted good engineering practices? [Criteria Reference .119(d)(3)(ii)]

(Review the documentation for evidence that compliance with the appropriate consensus standards has been researched.)

6. Has the employer determined and documented that existing equipment designed and constructed in accordance with codes, standards, or practices no longer in general use are designed, maintained, inspected, tested, and operating in a safe manner? [Criteria Reference .119(d)(3)(iii)]

(Documentation may be through methods such as: documenting successful prior operation procedures; documenting that the equipment is consistent with the appropriate editions of codes and standards; or performing an engineering analysis to determine that the equipment is appropriate for its intended use.)

B. On-site Conditions

1. Do observations of a representative sample of process chemicals and equipment indicate that the process information is complete? [Criteria Reference .119(d)]

(Information that does not correspond to the actual conditions demonstrates incomplete information. Check critical equipment and components to see if they have been properly identified.

2. Do observations of a representative sample of process components indicate that the process complies with recognized and generally accepted good engineering practice? [Criteria Reference .119(d)(3)(ii)]

(Review a representative number of safety devices such as pressure relief devices for proper sizing according to the maximum anticipated pressure.)

3. Do observations of a representative sample of the existing equipment designed and constructed according to codes, standards, or practices no longer in general use indicate that this equipment is inspected and is operated in a safe manner (as documented by the employer)? [Criteria Reference .119(d)(3)(iii)]

C. Interviews

Process Hazard Analysis (PHA) Team: 1. Based on interviews with a representative number of PHA team members, was the process safety information complete before the process hazard analysis was conducted? [Criteria Reference .119(d)]

Operators: 2. Based on interviews with a representative number of operators, is MSDS information readily available to the operators who work with hazardous materials? [Criteria Reference .1200]

Engineers (if any; or other qualified persons capable of providing the information requested; see Note, p. A-2): 3. Based on interviews with a representative number of engineers, has the employer documented that the process equipment complies with recognized and generally accepted good engineering practice? [Criteria Reference .119(d)(3)(ii)]

(Ask about the technical bases for design and selection of equipment, the materials of construction, electrical classifications, relief devices sizing versus maximum anticipated pressures, installation procedures to assure equipment meets design specifications, etc.)

For more information on Process Safety Information, see Appendix D, references 8. and 9.

1910.119(e): PROCESS HAZARD ANALYSIS

I. PROGRAM SUMMARY

The intent of this paragraph is to require the employer to develop a thorough, orderly, systematic approach for identifying, evaluating and controlling processes involving highly hazardous chemicals. Minimum requirements include: (1) Setting a priority order and conducting analyses according to the required schedule; (2) Using an appropriate

methodology to determine and evaluate the process hazards; (3) Addressing process hazards, previous incidents with catastrophic potential, engineering and administrative controls applicable to the hazards, consequences of failure of controls, facility siting, human factors, and a qualitative evaluation of possible safety and health effects of failure of controls on employees; (4) Performing PHA by a team with expertise in engineering and process operations, the process being evaluated, and the PHA methodology used; (5) Establishing a system to promptly address findings and recommendations, assure recommendations are resolved and documented, document action taken, develop a written schedule for completing actions, and communicate actions to operating, maintenance and other employees who work in the process or might be affected by actions; (6) Updating and revalidating PHA's at least every 5 years; and (7) Retaining PHA's and updates for the life of the process.

II. QUALITY CRITERIA REFERENCES

A. 1910.119(e): Process Hazard Analysis

III. VERIFICATION OF PROGRAM ELEMENTS

A. Records Review

1. Has the employer determined and documented a priority order for conducting initial PHA's based on a rationale that includes at least these factors: [Criteria Reference .119(e)(1)]

* the extent of process hazards * number of potentially affected employees * age of process * operating history?

2. Are the initial PHA's for processes covered by the PSM standard being performed as soon as possible? [Criteria Reference .119(e)(1)]

3. Does the priority schedule for PHA's assure that all initial PHA's will be performed by 5/26/97 and that: [Criteria Reference .119(e)(1)]

* No less than 25% of the PHA's shall be completed by 5/26/94? * No less than 50% of the PHA's shall be completed by 5/26/95? * No less than 75% of the PHA's shall be completed by 5/26/96?

(PHA's completed after May 26, 1987 which meet the requirements of this paragraph are acceptable as initial PHA's; they must be updated and revalidated at least every 5 years.)

4. Does the hazard evaluation use one or more of the following PHA methodologies: [Criteria Reference .119(e)(2)]

* What-if? * Checklist? * What-if/Checklist? * Hazard & Operability Study (HAZOP)? * Failure Mode and Effects Analysis (FMEA)? * Fault Tree Analysis (FTA)? * Other appropriate methodology?

(See Appendix B for a discussion of appropriate methodologies).

5. Does the PHA address the following: [Criteria Reference .119(e)(3)]

* The hazards of the process? * Previous incidents with likely potential for catastrophic consequences? * Consequences of failure of engineering and administrative controls?

(For example, potential injury, maximum release of hazardous materials, property damage, etc.)

5. (Continued) Does the PHA address the following: [Criteria Reference .119(e)(3)]

* Engineering and administrative controls applicable to the hazards and their interrelationships?

(Such controls may include appropriate application of detection methodologies to provide early warning of releases; inventory reduction; substitution of less hazardous materials; protective systems such as deluges, monitors, foams; increased separation distances; modification of the process temperature or pressure; redundancy in instrumentation; etc.)

* Facility siting?

(Review calculations, charts, and other documents that verify facility siting has been considered. For example, safe distances for locating control rooms may be based on studies of the individual characteristics of equipment involved such as: types of construction of the room, types and quantities of materials, types of reactions and processes, operating pressures and temperatures, presence of ignition sources, fire protection facilities, capabilities to respond to explosions, drainage facilities, location of fresh air intakes, etc.)

* Human factors?

(Such factors may include a review of operator/process and operator/equipment interface, the number of tasks operators must perform and the frequency, the evaluation of extended or unusual work schedules, the clarity and simplicity of control displays, automatic instrumentation versus manual procedures, operator feedback, clarity of signs and codes, etc.)

* A qualitative evaluation of a range of possible safety and health effects of failure of controls on employees in the workplace?

6. Are the process hazard analyses performed by teams with expertise in engineering and process operations, including at least one employee with experience and knowledge specific

to the process being evaluated and one member knowledgeable in the specific PHA methodology used? [Criteria Reference .119(e)(4)]

7. Has a system been established to promptly address the team's findings and recommendations? [Criteria Reference .119(e)(5)]

Review a representative sample of the documentation. Has the system been able to:

* Assure that the recommendations are resolved and documented in a timely manner?

* Document actions to be taken?

* Complete actions as soon as possible?

* Develop a written schedule of when actions are to be completed?

* Communicate the actions to operating, maintenance and other employees whose work assignments are in the process and who may be affected by the recommendations or actions?

8. Are the PHA's updated and revalidated at least every five years by a qualified team meeting the requirements in paragraph (e)(4), to assure that the process hazard analysis is consistent with the current process? [Criteria Reference .119(e)(6)]

9. Are all initial PHA's, updates or revalidations, and documented resolutions of recommendations kept for the life of the process? [Criteria Reference .119(e)(7)]

B. On-site Conditions

1. Do observations of a representative sample of process-related equipment indicate that obvious hazards have been identified, evaluated, and controlled? [Criteria Reference .119(e)(1)]

(For example, hydrocarbon or toxic gas monitors and alarms are present; electrical classifications are consistent with flammability hazards; destruct systems such as flares are in place and operating; control room siting is adequate or provisions have been made for blast resistant construction, pressurization, alarms, etc.; pressure relief valves and rupture disks are properly designed and discharge to a safe area; pipework is protected from impact; etc.)

2. Do observations of a representative sample of process-related equipment indicate that PHA recommendations have been promptly resolved? [Criteria Reference .119(e)(5)]

C. Interviews

PHA Team Member: 1. Based on interviews with a representative number of the PHA team members, are the PHA methodologies used appropriate for the complexity of the process? [Criteria Reference .119(e)(1)]

2. Based on interviews with a representative number of the PHA team members, is the priority order for conducting PHA's based on the extent of the process, the number of potentially affected employees, the age of the process, and the operating history of the process? [Criteria Reference .119(e)(1)]

3. Based on interviews with a representive number of the PHA team members, have the following been addressed: [Criteria Reference .119(e)(3)]

* The hazards of the process? * Previous incidents with likely potential for catastrophic consequences? * Engineering and administrative controls applicable to the hazards? * Consequences of control failures? * Facility siting? * Human factors? (Ask about shift rotations, extended schedules, and other possible sources of error.) * A qualitative evaluation of a range of possible safety and health effects of failure of controls on employees in the workplace?

4. Based on interviews with a representative number of the PHA team members, do the members have the appropriate expertise in engineering, process operations, and the process methodology used? Does one member of the team have experience and knowledge in the specific process? [Criteria Reference .119(e)(4)]

5. Based on interviews with a representative number of the PHA team members, does the system established by the employer address the team's findings and recommendations promptly? [Criteria Reference .119(e)(5)]

Operators and maintenance: 6. Based on interviews with a representative number of operator and maintenance employees, have the PHA's addressed the recognized hazards of the process and previous incidents which had a likely potential for catastrophic consequences? [Criteria Reference .119(e)(3)]

7. Based on interviews with operator, maintenance, and other employees who may be affected by PHA recommendations, have actions taken to resolve PHA (5) findings been communicated to these employees? [Criteria Reference .119(e)(5)]

For more information on PHA, see Appendix D, references: 8.; 9.; 10.; 11.; 12.; 13.; 14.; 15.; 16.; 17.; 25.; 26.; 27, Part I, Section UG-125; 31.; 32.; and 33.

1910.119(f): OPERATING PROCEDURES

I. PROGRAM SUMMARY

The intent of this paragraph is to provide clear instruction for conducting activities involved in covered processes that are consistent with the process safety information. The operating

procedures must address steps for each operating phase, operating limits, safety and health considerations, and safety systems and their functions.

II. QUALITY CRITERIA REFERENCES

A. 1910.119(f) D. 1910.1000 B. 1910.120 E. 1910.1200 C. 1910.147

III. VERIFICATION OF PROGRAM ELEMENTS

A. Records Review

1. Do written operating procedures exist for each covered process? Do the procedures provide clear instructions for conducting activities safely? [Criteria Reference .119(f)(1)]

2. Do the operating instructions address, as a minimum, step for each operating phase, including: [Criteria Reference .119(f)(1)(i)] * Initial start-up? * Normal operations? * Temporary operations? * Emergency shutdowns? * Conditions requiring emergency shutdown? * Assignment of shutdown responsibility to qualified operators? * Emergency operations? * Normal shutdown? * Start-ups following a turnaround or emergency shutdown?

3. Do the operating procedures include operating limits that outline consequences of process deviation and steps required to correct or avoid deviations? [Criteria Reference .119(f)(1)(ii)]

4. Have safety and health considerations been included in the operating procedures? Do they include at a minimum: [Criteria Reference .119(f)(1)(iii)]

* Properties of, and hazards presented by, chemicals used in the process?

* Precautions necessary to prevent exposure, including engineering controls, administrative controls, and personal protective equipment?

* Control measures to be taken if physical contact or airborne exposure occurs?

* Quality control for raw materials and control of hazardous chemical inventory levels?

* Any special or unique hazards?

5. Are safety systems and their functions included in the operating procedures? [Criteria Reference .119(f)(1)(iv)]

6. Are the operating instructions consistent with the process safety information? [Criteria Reference .119(f)(1)]

7. Are operating procedures readily accessible to employees who work in or maintain a process? [Criteria Reference .119(f)(2)]

8. Are operating procedures reviewed as often as necessary to assure that they reflect current operating practice? Are they certified annually by the employer that they are current and accurate? Do they reflect current operating practices that have resulted from changes in: [Criteria Reference .119(f)(3)] * Process chemicals? * Technology? * Equipment? * Facilities?

9. Have safe work practices been developed and implemented for employees and contractors to control hazards during operations such as: [Criteria Reference .119(f)(4)] * Lockout/tagout? * Confined space entry? * Opening process equipment or piping? * Control over entrance into a facility by maintenance, contractor, laboratory or other support personnel?

B. On-site Conditions

1. Does observation of a representative sample of processes indicate that the written operating procedures are being implemented? [Criteria Reference .119(f)(1)]

2. Does observation of a representative sample of processes indicate that the written operating procedures are readily accessible to employees who work or maintain a process? [Criteria Reference .119(f)(2)]

3. Does observation of a representative sample of processes indicate that operating procedures reflect current practice, including changes that result from process chemicals, technology, equipment, and facilities? [Criteria Reference .119(f)(3)]

(Observe to see if actual procedures match the written operating procedures.)

4. Does observation of representative operations indicate that safe work practices have been implemented for company and contractor employees? Do such work practices include, where appropriate: [Criteria Reference .119(f)(4)] * Lockout/tagout? * Confined space entry? * Opening process equipment or piping? * Control over entrance into a facility by maintenance, contractor, laboratory, and other support personnel?

C. Interviews

1. Based on interviews with a representative number of operators, are the written operating procedures implemented for each covered process? [Criteria Reference .119(f)(1)]

2. Based on interviews with a representative number of operators, do operating procedures provide clear instructions for safely conducting activities? [Criteria Reference .119(f)(1)]

(Specifically ask for conditions requiring emergency shutdown, the operating limits of a particular process or item of equipment, what might occur if a deviation from those limits

should take place, steps to avoid the deviation, and precautions necessary to prevent exposure to hazardous chemicals.)

3. Based on interviews with a representative number of employees who work in or maintain a process, are the operating procedures readily accessible? [Criteria Reference .119(f)(2)]

4. Based on interviews with a representative number of operators and maintenance employees, do the operating procedures reflect current operating practice? [Criteria Reference .119(f)(3)]

1910.119(g): TRAINING

I. PROGRAM SUMMARY

The intent of this paragraph helps employees and contractor employees understand the nature and causes of problems arising from process operations, and increases employee awareness with respect to the hazards particular to a process. An effective training program significantly reduces the number and severity of incidents arising from process operations, and can be instrumental in preventing small problems from leading to a catastrophic release. Minimum requirements for an effective training program include: Initial Training, Refresher Training, and Documentation.

II. QUALITY CRITERIA REFERENCES

A. 1910.119(g): Training B. 1910.119(f)(1): Operating procedures

III. VERIFICATION OF PROGRAM ELEMENTS

A. Records Review

1. For employees and contractor employees involved in operating a process do initial and refresher training records exist? Do the records contain the identity of the employee, the date of the training, and the means used to verify that the employee understood the training? [Criteria Reference .119(g)(1)(i)]

2. Has each employee and contractor employee been trained before being involved in a newly assigned process (except employees involved in operating a process prior to 5/26/92)? [Criteria Reference .119(g)(1)(i)]

3. If initial training has not been given to employees and contractor employees involved in operating a process prior to 5/26/92, is there written certification that they have the required knowledge, skills and abilities to safely carry out the duties and responsibilities specified in the operating procedures? [Criteria Reference .119(g)(1)(ii)]

(Review the documents to make sure the certification has not been invalidated by a change in duties.)

4. Has each employee and contractor employee involved in operating a process been trained in an overview of the process and the operating procedures including: [Criteria Reference .119(g)(1)(i)] * Steps for each operating phase? Initial startup, normal operations, temporary operations, emergency shutdown, emergency operations, normal shutdown, and startup following a turnaround or emergency shutdown * Operating limits? Consequences of deviations and steps required to avoid deviations * Safety and health considerations? Properties and hazards of chemicals used and precautions for preventing exposure * Safety systems and their functions?

5. Has the employer consulted with employees and contractor employees involved in operating the process to determine the appropriate frequency for refresher training? Is the frequency at least once every 3 years? [Criteria Reference .119(g)(2)]

B. On-site Conditions

Verification is not required. [Criteria Reference .119(g)(1) or (2)]

C. Interviews

1. Based on interviews with a representative number of employees, has their training emphasized specific safety and health hazards, emergency operations including shutdown, and safe work practices applicable to their tasks? [Criteria Reference .119(g)(1)(i)]

2. Based on interviews with employees named as having provided consultation, has the employer consulted with employees involved in operating the process to determine the appropriate frequency of refresher training? [Criteria Reference .119(g)(2)]

1910.119 (h) CONTRACTORS

I. PROGRAMS SUMMARY

The intent of this paragraph is to require employers who use contractors to perform work in and around processes that involve highly hazardous chemicals to establish a screening process so that they hire and use contractors who accomplish the desired job tasks without compromising the safety and health of employees at a facility. The contractor must assure that contract employees are trained on performing the job safely, of the hazards related to the job, and applicable provisions of the emergency action plan.

NOTE: The term contractor includes subcontractor.

II. QUALITY CRITERIA REFERENCES

A. 1910.119(h) B. 1910.119(f)(4) C. 1910.119(n) D. 29 CFR 1926 Subpart C (for contractors engaged in construction work) E. 1910.119 Appendix C, 57 Fed. Reg. 6413/3 F. 1910.119 Appendix D, Sources 7, 9, and 10

NOTE: Other provisions of 1910.119, such as (g) and (j), may also apply in appropriate circumstances.

III. VERIFICATION OF PROGRAM ELEMENTS

A. Records Review - Employer's Program [Criteria Reference .119(h)(1)]

1. Does the program include all contractor activities that have the potential for affecting process safety, including--but not limited to--contractors performing maintenance or repair, turnaround, major renovation or specialty work on or adjacent to covered processes?

(Contractors performing incidental services which do not influence process safety such as janitorial work, food and drink services, laundry, delivery, and other supply services need not be included However, contractors performing construction, demolition, equipment installation, and other work that may affect the safety of a covered process should be included.)

2. Is the information regarding the contractor's safety performance and programs obtained and evaluated for selection of contractors? [Criteria Reference .119(h)(2)(i), .119 Appndxs C & D]

3. Are the contract employers informed, prior to the initiation of the contractors' work at the site, of the known potential fire, explosion, or toxic release hazards related to the contractors' work and the processes? [Criteria Reference .119(h)(2)(ii)]

4. Are contract employers informed, prior to the initiation of the contractors' work at the site, of the applicable provisions of the emergency action plan required by .119(n)? [Criteria Reference .119(h)(2)(iii)]

5. Have safe work practices to control the entrance, presence and exit of contract employers and contract employees in covered process areas been developed and implemented? [Criteria Reference .119(h)(2)(iv); .119(f)(4)]

6. Are contract employers periodically evaluated for their performance in fulfilling their obligations to: [Criteria Reference .119(h)(2)(v)]

* Assure their employees are trained in safe work practices needed to perform the job? * Assure their employees are instructed in the known potential fire, explosion, or toxic release hazards related to the job and the applicable provisions of the emergency action plan? * Document the required training and the means to verify their employees have understood the

training? * Assure their employees follow the facility safety rules and work practices? * Advise the employer of unique hazards presented by the contractor's work?

7. Has the host employer ensured, through periodic evaluations, that the training provided to contractor employees by the contractor employer is equivalent to the training required for direct hire employees? [Criteria Reference .119(h)(2)(v)]

8. If the employer has identified deficiencies in the performance of contract employers, what action has the employer taken to correct the deficiencies? [Criteria Reference .119(h)(2)(v)]

9. Does the employer maintain a contract employee injury and illness log related to the contractor's work in process areas? [Criteria Reference .119(h)(2)(vi)]

Records Review - Contractor's Programs

10. Are all contractor employees trained in the work practices necessary to perform their jobs safely? [Criteria Reference .119(h)(3)(i)]

11. Is each contract employee instructed in the known potential fire, explosion, or toxic release hazards related to his/her job and the processes and applicable provisions of the emergency action plan? [Criteria Reference .119(h)(3)(ii)]

12. Is there documentation that each contract employee has received and understands the required training? [Criteria Reference .119(h)(3)(iii)]

13. Do the contract employee training records contain the following: [Criteria Reference .119(h)(3)(iii)] * The identity of the employee? * The date of the training? * The means used to verify that the training was understood?

14. Are there means to assure that contract employees follow the safety rules of the facility, including safe work practices required in .119(f)(4)? [Criteria Reference .119(h)(3)(iv); .119(f)(4)]

(Review evidence of enforcement by the contractor.)

15. Is the employer advised of any unique hazards presented by the contract employer's work or any hazards found by the contract employer's work? [Criteria Reference .119(h)(3)(v)]

B. On-site Conditions

1. Based on a representative sample of observations of contractor employees, has the employer's program to control their entrance, presence, and exit been implemented? [Criteria Reference .119(h)(2)(iv)]

2. Based on a representative sample of observations of contractor employees, do they follow the safety rules of the facility? [Criteria Reference .119(h)(3)(iv)]

(These rules include the employer's safe work practices such as lockout/tagout, confined space entry, and opening process equipment or piping; they may also include other rules such as excavation procedures or use of PPE.)

C. Interviews

1. Based on interviews with contractor employers, did the host employer obtain and evaluate information regarding the contractor's safety performance and programs for selection of contractors? [Criteria Reference .119(h)(2)(i); .119 Appndxs C & D]

2. Based on interviews with contractor employers, have they been informed of the known fire, explosion, or toxic release hazards related to their work and the processes in which they are involved prior to the initiation of their work at the site? [Criteria Reference .119(h)(2)(ii)]

3. Based on interviews with contractor employers, have they been informed of the applicable provisions of the employer's emergency action plan prior to the initiation of their work at the site? [Criteria Reference .119(h)(2)(iii)]

4. Based on interviews with contractor employers and employees, have work practices to control their entrance, presence, and exit of covered process areas been implemented? [Criteria Reference .119(h)(2)(iv)]

5. Based on interviews with the contractor employer, has the employer periodically evaluated the contractor's performance in fulfilling the obligations required in .119(h)(3) to: [Criteria Reference .119(h)(2)(v)] * Assure their employees are trained in safe work practices needed to perform the job? * Assure their employees are instructed in the known potential fire, explosion, or toxic release hazards related to the job and the applicable provisions of the emergency action plan? * Document the required training and the means to verify their employees have understood the training? * Assure their employees follow the facility safety rules and work practices? * Advise the employer of unique hazards presented by the contractor's work?

6. Based on interviews with the contractors employer, has the host employer ensured, through periodic evaluations, that the training provided to contractor employees by the contractor employer is equivalent to the training required for direct hire employees? [Criteria Reference .119(h)(2)(v)]

7. Based on interviews with the contractor employer, if the employer has identified deficiencies in the performance of contract employers, what action has the employer taken to correct the deficiencies? [Criteria .119(h)(2)(v)]

8. Based on interviews with a representative number of contractor employees, has the contractor employer trained them in the work practices necessary to perform their jobs? [Criteria Reference .119(h)(3)(i)]

9. Based on interviews with a representative number of contractor employees, are they being instructed in the known potential fire, explosion, or toxic release hazards related to their work and the processes in which they are involved? [Criteria Reference .119(h)(3)(ii)]

10. Based on the interview with a representive number of contractor employees, have they been instructed in the applicable provisions of the emergency action plan? [Criteria Reference .119(h)(3)(ii)]

(Ask them to explain the plan and evacuation procedures.)

11. Based on interviews with a representative number of contractors employees, has the contract employer assured that they follow the safety rules of the facility? [Criteria Reference .119(h)(3)(iv)]

(Ask how safe work practices, entry restrictions for the facility, and use of required PPE are enforced.)

For additional information on Contractors, see Appendix D, reference 16.

1910.119(i): PRE-STARTUP SAFETY REVIEW

I. PROGRAM SUMMARY

The intent of this paragraph is to make sure that, for new facilities an for modified facilities when the modification necessitates a change to process safety information, certain important considerations are addressed before any highly hazardous chemicals are introduced into the process. Minimum requirements include that the pre-startup safety review confirm the following: construction and equipment is in accordance with design specifications; safety, operating, maintenance, and emergency procedures are in place and adequate; for new facilities, a PHA has been performed and recommendations resolved or implemented; modified facilities meet the requirements of paragraph (1), management of change; and training of each employee involved in the process has been completed.

II. QUALITY CRITERIA REFERENCES

A. 1910.119(i): Pre-startup Safety Review B. 1910.119(l): Management of Change

III. VERIFICATION OF PROGRAM ELEMENTS

A. Records Review

1. Has a pre-startup safety review been performed for all new facilities and for modified facilities when the modification is significant enough to require a change in process safety information? [Criteria Reference .119(i)(1)]

2. Do pre-startup safety reviews confirm that prior to the introduction of highly hazardous chemicals to a process: [Criteria Reference .119(i)(2)]

* Construction and equipment is in accordance with design Specifications?

* Safety, operating, maintenance, and emergency procedures are in place and adequate?

2. (Continued) Do pre-startup safety reviews confirm that prior to the introduction of highly hazardous chemicals to a process: [Criteria Reference .119(i)(2)]

* For new facilities, a PHA has been performed and recommendations resolved or implemented before startup?

* Modified facilities meet requirements of paragraph (1)?

* Training of each employee involved in operating the process has been completed?

On-site Conditions

1. Do observations of new or modified facilities indicate that prior to the introduction of highly hazardous chemicals: * Construction and equipment is in accordance with design specifications? * Safety, operating, maintenance, and emergency procedures are in place and adequate?

C. Interviews (See NOTE, p. A-2.]

1. Based on interviews with a representative sample of operators, maintenance employees, and engineers, can it be confirmed that the construction and equipment are in accordance with design specifications prior to introducing highly hazardous chemicals to a process? [Criteria Reference .119(i)2(i)]

2. Based on interviews with a representative sample of operators, maintenance employees, and engineers, are safety, operating, maintenance, and emergency procedures in place prior to introduction of highly hazardous chemicals into a process? Are these procedures adequate? [Criteria Reference .119(i)2(ii)]

3. Based on interviews with a representative sample of operators, maintenance employees, and engineers, is a PHA performed and are recommendations resolved prior to a startup that introduces highly hazardous chemicals into a new process? [Criteria Reference .119(i)2(iii)]

4. Based on interviews with a representative sample of operators, maintenance employees, and engineers, do modified facilities meet requirements of paragraph (1), Management of Change prior to introducing a highly hazardous chemical? [Criteria Reference .119(i)2(iii)]

5. Based on interviews with a representative sample of operators, is training completed for each employee involved in operating the process prior to the introduction of a highly hazardous chemical? [Criteria Reference .119(i)2(iv)]

1910.119(j): MECHANICAL INTEGRITY

I. PROGRAM SUMMARY

The intent of this paragraph is to assure that equipment used to process store, or handle highly hazardous chemicals is designed, constructed; installed, and maintained to minimize the risk of releases of such chemicals. This requires that a mechanical integrity program be in place to assure the continued integrity of process equipment. The elements of a mechanical integrity program include the identification and categorization of equipment and instrumentation, development of written maintenance procedures, training for process maintenance activities, inspection and testing, correction of deficiencies in equipment that are outside acceptable limits defined by the process safety information, and development of a quality assurance program.

II. QUALITY CRITERIA REFERENCES

A. .119(j): Mechanical integrity

III. VERIFICATION OF PROGRAM ELEMENTS

A. Records Review

1. Does the written mechanical integrity program include? [Criteria Reference .119(j)(1)] * Pressure vessels and storage tanks * Piping systems and components such as valves * Relief and vent systems and devices * Emergency shutdown systems * Controls (including monitoring devices and sensors, alarms and interlocks) * Pumps

2. Are there written procedures to maintain the on-going integrity of process equipment? Does the documentation indicate the procedures have been implemented? [Criteria Reference .119(j)(2)]

3. Has training been provided to each employee contractor employee involved in maintaining the on-going integrity of process equipment in the following: [Criteria Reference .119(j)(3)] * An overview of the process and its hazards? * Procedures applicable to the employee's job tasks to assure that the employee can perform the job tasks in a safe manner?

(Review certification documents for employees doing non-destructive tests, welding on pressure vessels, etc., where these certifications are required.)

4. Are inspections and tests performed on each item of process equipment included in the program? [Criteria Reference .119(j)(4)(i)]

5. Do inspection and testing procedures follow good engineering practices? [Criteria Reference .119(j)(4)(ii)]

6. Are inspection and test frequencies consistent with the manufacturer's recommendation and good engineering practice? Are inspections and tests performed more frequently if determined necessary by operating experience? [Criteria Reference .119 (j)(4)(iii)]

7. Is there documentation of each inspection and test that has been performed including all of the following: [Criteria Reference .119(j)(4)(iv)] * Date of the inspection or test? * Name of person performing the procedure? * Serial number or other identifier of equipment on which procedure was performed? * Description of inspection or test performed? * Results of inspection or test?

8. Are deficiencies in equipment that are outside limits (as defined in process safety information) corrected before further use or in a safe and timely manner when necessary means are taken to assure safe operation? [Criteria Reference .119(j)(5)]

9. In the construction of new plants and equipment, does the employer assure that equipment as it is fabricated is suitable for the process for which it will be used? [Criteria Reference .119(j)(6)(i)]

10. Have appropriate checks and inspections been made to assure equipment is installed properly and consistent with design specifications and manufacturer's instructions? [Criteria Reference .119(j)(6)(ii)]

(Include contractor supplied equipment.)

11. Does the employer assure that maintenance materials, spare parts, and equipment are suitable for the process application for which they are used? [Criteria Reference .119(j)(6)(iii)]

(Include contractor supplied equipment.)

B. On-site Conditions

1. Do observations of a representative sample of process equipment indicate deficiencies outside acceptable limits? [Criteria Reference .119(j)(5)]

(Compare process safety information criteria with the conditions of the equipment found in the process.)

2. If new plants or equipment are being constructed, do observations indicate that the equipment as it is fabricated is suitable for the process application? [Criteria Reference .119(j)(6)(i)]

3. Do observations of a representative sample of maintenance materials, spare parts, and equipment indicate that they are suitable for the process application for which they will be used? [Criteria Reference .119(j)(6)(iii)]

C. Interviews

Engineers (if any; or other qualified persons capable of providing the information requested; see NOTE, p. A-2): 1. Based on interviews with a representative number of engineers, have procedures to maintain the on-going integrity of the process equipment been implemented for: [Criteria Reference .119(j)(2)] * Pressure vessels and storage tanks? * Piping systems and components such as valves? * Relief and vent systems and devices? * Emergency shutdown systems? * Controls (including monitoring devices and sensors, alarms and interlocks)? * Pumps?

(Ask about the possibility of safety critical equipment being inadvertently rendered inoperative. For example, a relief device might be isolated by closing an upstream valve.)

2. Based on interviews with a representative number of engineers, do the inspection and testing procedures follow recognized and generally accepted good engineering practice? Has prior operating experience indicated a need for a more frequent test and inspection schedule than has been implemented? [Criteria Reference .119(j)(4)]

3. Based on interviews with a representative number of engineers, are equipment deficiencies corrected before use when they are outside the acceptable limits? If not, are the deficiencies corrected in a timely manner and are necessary means taken to assure safe operation? [Criteria Reference .119(j)(5)]

4. Based on interviews with a representative number of engineers, has the employer assured that, for new plants and equipment, the equipment as it is fabricated is suitable for the process application? Are appropriate checks and inspections made to assure equipment is installed properly and consistent with design specifications and manufacturer's instructions? Are maintenance materials, spare parts, and equipment suitable for the process application for which they will be used? [Criteria Reference .119(j)(6)]

(Ask about contractor supplied items.)

Maintenance: 5. Based on interviews with a representative number of maintenance employees (and, where applicable, contractor maintenance employees), have the written

procedures for maintaining the on-going integrity of process equipment been implemented? [Criteria Reference .119(j)(2)]

6. Based on interviews with a representative number of employees and contractor employees involved in maintaining the on-going integrity of the process, have they been trained to assure they can perform their tasks in a safe manner? Did the training include an overview of the process, its hazards, and procedures applicable to the job? [Criteria Reference .119(j)(3)]

(Determine if certification, specialized training, or unique qualifications are required.)

7. Based on interviews with a representative number of maintenance employees, do test and inspection procedures follow recognized and generally accepted good engineering practices? Is the frequency of inspections and tests consistent with applicable manufacturer's recommendations and good engineering practices? Are more frequent inspections and tests necessary due as indicated by prior operating experience? [Criteria Reference .119(j)(4)]

8. Based on interviews with a representative number of maintenance employees, are equipment deficiencies that are outside acceptable limits corrected before further use? If not, are corrections made in a timely manner and are necessary means taken to assure operation? [Criteria Reference .119(j)(5)]

9. Based on interviews with a representative number of maintenance employees, are maintenance materials, spare parts and equipment suitable for the process application for which they are intended? [Criteria Reference .119(j)(6)]

(Ask about availability and use of substitutes.)

For additional information on Mechanical Integrity, see Appendix D, reference: 9.; 18.; 19.; 20.; 21.; 22.; 23.; 27.; 28.; 29.; and 34.

1910.119(k): HOT WORK PERMIT

I. PROGRAM SUMMARY

The intent of this paragraph is to require employers to control, in a consistent manner, nonroutine work conducted in process areas. Specifically, this subparagraph is concerned with the permitting of hot work operations associated with welding and cutting in process areas.

Minimum requirements include: that the employer issue a hot work permit for hot work operations conducted on or near a covered process and that hot work permits shall document compliance with the fire prevention and protection requirements of 29 CFR 1910.252(a).

II. QUALITY CRITERIA REFERENCES

A. 1910.119(k): Hot Work Permit B. 1910.252(a): Fire Prevention and Protection

III. VERIFICATION OF PROGRAM ELEMENTS

A. Records Review

1. Have hot work permits been issued for all hot work operations conducted on or near a process covered by this standard? [Criteria Reference .119(k)(1)]

2. Do the hot work permits indicate the date(s) authorized for hot work performed? [Criteria Reference .119(k)(2)]

3. Do the hot work permits describe the object on which the hot work is to be performed? [Criteria Reference .119(k)(2)]

4. Have the hot work permits been kept on file until the hot work operations were complete? [Criteria Reference .119(k)(2)]

5. Have the hot work permits identified openings, cracks and holes where sparks may drop to combustible materials below? [Criteria Reference .252(a)(2)(i)]

6. Have the hot work permits described the fire extinguisher required to handle any emergencies? [Criteria Reference .252(a)(2)(ii)]

7. Have the hot work permits assigned fire watchers whenever welding is performed in locations where other than a minor fire might develop? [Criteria Reference .252(a)(2)(iii)]

8. Are the hot work permits being authorized, preferably in writing, by the "individual" responsible for all welding and cutting operations? Is authorization preceded by site & inspection and designation of appropriate precautions? [Criteria Reference .252(a)(2)(iv) & .252(a)(2)(xiii)(A)]

9. Have the hot work permits described precautions associated with combustible materials on floors or floors, walls, partitions, ceilings or roofs of combustible construction? [Criteria Reference .252(a)(2)(v) & .252(a)(2)(ix]

10. Has hot work permitting been successful in prohibiting welding in unauthorized areas, in sprinklered buildings while such protection is impaired, in the presence of explosive atmospheres, and in storage areas for large quantities of readily ignitable materials? [Criteria Reference .252(a)(2)(vi)]

11. Have the hot work permits required relocation of combustibles where practicable and covering with flameproofed covers where not practicable? [Criteria Reference .252(a)(2)(vii)]

12. Have hot work permits identified for shutdown any ducts or conveyors systems that may convey sparks to distant combustibles? [Criteria Reference .252(a)(2)(viii)]

13. Have hot work permits required precautions whenever welding on components (e.g., steel members, pipes, etc,) that could transmit heat by radiation or conduction to unobserved combustibles? [Criteria Reference .252(a)(2)(x) & .252(a)(2)(xii)]

14. Have hot work permits identified hazards associated with welding on walls, partitions, ceilings or roofs with combustible coverings or welding on walls or panels of sandwich-type construction? [Criteria Reference .252(a)(2)(xi)]

15. Has management established areas and procedures for safe welding and cutting based on fire potential? [Criteria Reference .252(a)(2)(xiii)]

16. Has management designated the "individual" responsible for authorizing cutting and welding operations in process areas? [Criteria Reference .252(a)(2)(xiii)(B)]

17. Has management ensured that welders, cutters and supervisors are trained in the safe operation of their equipment? [Criteria Reference .252(a)(2)(xiii)(C)]

18. Has management advised outside contractors working on their site about all hot work permitting programs? [Criteria Reference .252(a)(2)(xiii)(D)]

19. Has the Supervisor determined if combustibles are being protected from ignition prior to welding by moving them, shielding them, or scheduling welding around their production? [Criteria Reference .252(a)(2)(xiv)(A)(B) & (C)]

20. Has the Supervisor, prior to welding, secured authorization from the responsible "individual" designated by management? [Criteria Reference .252(a)(2)(xiv)(D]

B. On-Site Conditions

1. Conduct checks of **current** welding and cutting operations to ensure compliance with the requirements of 1910.119(k) and 1910.252(a). The twenty items listed above in "Records Review" may serve as an audit checklist. A **management representative**, the **"individual" responsible** for welding operations and the **supervisor** should all be invited to participate in this on-site check. [Criteria Reference .119(k) & .252(a)]

C. Interviews - Employees and Contractors

1. Based on interviews with a representative number of maintenance and contractor employees, has the Supervisor visited welding work operations to verify that: [Criteria Reference .252(a)(2)(xiv)(E),(F) & (G)]

* Welders have approval for safe go ahead prior to welding? * Fire protection and extinguishing equipment is properly located at the work site? * Fire watches are functional, where required?

2. Based on interviews with a representative number of maintenance and contractor employees, have hot work permits been issued for all hot work operations conducted on or near a process covered by this standard? [Criteria Reference .119(k)(1)]

3. Based on interviews with a representative number of maintenance and contractor employees, have the hot work permits been kept on file until the hot work operations were complete? [Criteria Reference .119(k)(2)]

4. Based on interviews with a representative number of maintenance and contractor employees, have the hot work permits identified openings, cracks and holes where sparks may drop to combustible materials below? [Criteria Reference .252(a)(2)(i)]

5. Based on interviews with a representative number of maintenance and contractor employees, have the hot work permits assigned fire watchers whenever welding is performed in locations where other than a minor fire might develop? [Criteria Reference .252(a)(2)(iii)]

6. Based on interviews with a representative number of maintenance and contractor employees, are the hot work permits being authorized, preferably in writing, by the "individual" responsible for all welding and cutting operations? Is authorization preceded by site inspection and designation of appropriate precautions? [Criteria Reference .252(a)(2)(iv) & .252(a)(2)(xiii)(A)]

7. Based on interviews with a representative number of maintenance and contractor employees, have the hot work permits described precautions associated with combustible materials on floors or floors, walls, partitions, ceilings or roofs of combustible construction? [Criteria Reference .252(a)(2)(v) & .252(a)(2)(ix)]

8. Based on interviews with a representative number of maintenance and contractor employees, has hot work permitting been successful in prohibiting welding in: [Criteria Reference .252(a)(2)(vi)] * Unauthorized areas? * Sprinklered buildings while such protection is impaired? * The presence of explosive atmospheres? * Storage areas for large quantities of readily ignitable materials?

9. Based on interviews with a representative number of maintenance and contractor employees, have the hot work permits required relocation of combustibles where practicable and covering with flameproofed covers where not practicable? [Criteria Reference .252(a)(2)(vii)]

10. Based on interviews with a representative number of maintenance and contractor employees, have hot work permits identified for shutdown any ducts or conveyors systems that may convey sparks to distant combustibles? [Criteria Reference .252(a)(2)(viii)]

11. Based on interviews with a representative number of maintenance and contractor employees, have hot work permits required precautions whenever welding on components (e.g., steel members, pipes, etc.) that could transmit heat by radiation or conduction to unobserved combustibles? [Criteria Reference .252(a)(2)(x) & .252(a)(2)(xii)]

12. Based on interviews with a representative number of maintenance and contractor employees, have hot work permits identified hazards associated with welding on walls, partitions, ceilings or roofs with combustible coverings or welding on walls or panels of sandwich-type construction? [Criteria Reference .252(a)(2)(xi)]

13. Based on interviews with a representative number of maintenance and contractor employees, has management established areas and procedures for safe welding and cutting based on fire potential? [Criteria Reference .252(a)(2)(xiii)]

14. Based on interviews with a representative number of maintenance and contractor employees, has management designated the "individual" responsible for authorizing cutting and welding operations in process areas? [Criteria Reference .252(a)(2)(xiii)(B)]

15. Based on interviews with a representative number of maintenance and contractor employees, has management ensured that welders, cutters and supervisors are trained in the safe operation of their equipment? [Criteria Reference .252(a)(2)(xiii)(C)]

16. Based on interviews with contractors and contractor employees, has management advised outside contractors working on the site about all hot work permitting programs? [Criteria Reference .252(a)(2)(xiii)(D)]

17. Based on interviews with a representative number of maintenance and contractor employees, has the supervisor determined if combustibles are being protected from ignition prior to welding by moving them, shielding them, or scheduling welding around their production? [Criteria Reference .252(a)(2)(xiv)(A)(B) & (C)]

1910.119(l): MANAGEMENT OF CHANGE

I. PROGRAM SUMMARY

The intent of this paragraph is to require management of all modifications to equipment, procedures, raw materials and processing conditions other than "replacement in kind" by identifying and reviewing them prior to implementation of the change. Minimum requirements for management of change include: establishing written procedures to manage change; addressing the technical basis, impact on safety and health, modification to operating procedures, necessary time period, and authorizations required; informing and

training employees affected; and updating process safety information and operating procedures or practices.

II. QUALITY CRITERIA REFERENCES

A. 1910.119(l): Management of Change

III. VERIFICATION OF PROGRAM ELEMENTS

A. Records Review

1. Are there written procedures for managing changes (except for "replacements in kind") to process chemicals, technology, equipment, and procedures and changes to facilities that affect a covered process? [Criteria Reference .119(l)(1)]

(Review procedures that address responsibilities, steps for assessing risks and approving changes, requirements for reviewing designs for temporary and permanent changes, steps needed to verify that modifications have been made as designed, variance procedures, time limit authorizations for temporary changes, and steps required to return the process to status quo after temporary changes.)

2. Do the procedures assure that the technical basis for the proposed change is addressed prior to any change? [Criteria Reference .119(l)(2)(i)]

3. Do the procedures assure that the impact of the change on safety and health is addressed prior to any change? [Criteria Reference .119(l)(2)(ii)]

4. Do the procedures assure that modifications to operating procedures is addressed prior to any change? [Criteria Reference .119(l)(2)(iii)]

5. Do the procedures assure that the necessary time period for the change is addressed prior to any change? [Criteria Reference .119(l)(2)(iv)]

6. Do the procedures assure that the authorization requirements for the proposed change are addressed prior to any change? [Criteria Reference .119(l)(2)(v)]

7. Are employees involved in operating a process, and maintenance and contract employees whose job tasks will be affected by change informed of, and trained in, the change prior to start-up of process or affected part of process? [Criteria Reference .119(l)(3)]

8. Is the process safety information required by paragraph (d) updated if changed? [Criteria Reference .119(l)(4)]

9. Are the operating procedures or practices required by paragraph (f) updated if changed? [Criteria Reference .119(l)(5)]

B. On-site Conditions

1. Do observations of new or recently modified process chemicals, technology, equipment, or procedures (except "replacement in kind") indicate that the Management of Change procedures have been implemented? [Criteria Reference .119(l)(1)]

(Determine if records are available to support the procedures for new or revised processes found in the facility.)

C. Interviews

Operator, Maintenance, and Contractor Employees:

1. Based on interviews with operators, maintenance employees and contractor employees, are procedures implemented to manage changes to existing process chemicals, technology, equipment, facilities, and procedures? [Criteria Reference .119(l)(1)]

2. Based on interviews with operators, maintenance employees and contractor employees, is training in process changes provided to employees whose job tasks will be affected by the changes prior to start-up? [Criteria Reference .119(l)(3)]

For additional information on Management of Change, see Appendix D, reference 9., Chapter 7.

1910.119(m): INCIDENT INVESTIGATIONS

I. PROGRAM SUMMARY

The employer is required to investigate each incident which resulted in, or could reasonably have resulted in a catastrophic release of highly hazardous chemical in the workplace. An investigation shall be initiated no later than 48 hours following the incident. An investigation team shall be established and a report prepared which includes: 1) Date of incident 2) Date investigation began 3) Description of incident 4) Factors that contributed to the incident 5) Recommendations from the investigation. The employer is required to establish a system to promptly address the incident report findings and recommendations, documenting all resolutions and corrective actions. Incident reports shall be reviewed with all affected personnel whose job tasks are relevant to the investigation and retained for five years.

II. QUALITY CRITERIA REFERENCES

A. 1910.119(m): Incident Investigations

III. VERIFICATION OF PROGRAM ELEMENTS

A. Records Review

1. Has each incident been investigated which resulted in, or could reasonably have resulted in a catastrophic release of highly hazardous chemicals in the workplace? [Criteria Reference .119(m)(1)]

2. Have incident investigations been initiated as promptly as possible, but not later than 48 hours following the incident? [Criteria Reference .119(m)(2)]

3. Have incident investigation teams been established? Do the teams contain at least one person knowledgeable in the process involved in the incident, and other members with appropriate knowledge and experience to thoroughly investigate and analyze the incident? Has a contractor employee been included in the team if the incident involved work of the contractor? [Criteria Reference .119(m)(3)]

4. Have incident investigation reports been prepared at the conclusion of the investigation which include at minimum: [Criteria Reference .119(m)(4)] * Date of the incident? * Date the inspection began? * A description of the incident? * The factors that contributed to the incident? * Any recommendations resulting from the investigation?

5. Has a system been established to promptly address and resolve the incident investigation report findings and recommendations? [Criteria Reference .119(m)(5)]

6. Have resolutions and corrective actions from the incident investigation reports been documented? [Criteria Reference .119(m)(5)]

7. Have incident investigation reports been reviewed with all affected personnel whose job tasks are relevant to the incident findings including contract employees, where applicable? [Criteria Reference .119(m)(6)]

8. Are incident investigation reports retained for five years? [Criteria Reference .119(m)(7)]

B. On-site Conditions

1. Do observations of a representative sample of process components involved in incident investigations indicate that recommendations have been resolved? [Criteria Reference .119(m)(5)]

(Compare the corrective actions outlined in the investigation documentation with the actual equipment, procedures, material use, etc.)

C. Interviews

1. Based on interviews with a representative number of operators, maintenance employees and contractor employees, have all incidents that resulted in or could reasonably have resulted in a catastrophic release of highly hazardous chemicals in the workplace, been investigated? [Criteria Reference .119(m)(1)]

2. Based on interviews with a representative number of the members of past investigation teams, do the teams contain at least one person knowledgeable in the process involved in the incident, and other persons with appropriate knowledge and experience to thoroughly investigate and analyze the incident? Was a contractor employee included in the team if the incident involved work of the contractor? [Criteria Reference .119(m)(3)]

3. Based on interviews with a representative number of employees whose job tasks are relevant to the past incident investigation findings, have the investigation reports been reviewed with the affected personnel? [Criteria Reference .119(m)(6)]

For additional information on Incident Investigations, see Appendix D, references 9. and 24.

1910.119 (n): EMERGENCY PLANNING AND RESPONSE

I. PROGRAM SUMMARY

The intent of this paragraph is to require the employer to address what actions employees are to take when there is an unwanted release of highly hazardous chemicals. The employer must establish and implement an emergency action plan in accordance with the provisions of 29 CFR 1910.38(a) and include procedure. for handling small releases. Certain provisions of the hazardous waste and emergency response standard, 29 CFR 1910.120(a), (p), and (q), may also apply.

[NOTE: 1910.120(a) addresses scope, application, and definitions for the entire standard. 1910.120(p) addresses treatment, storage, and disposal (TSD) facilities under the Resource Conservation and Recovery Act (RCRA). 1910.120(q) addresses requirements for facilities that are not RCRA TSD's, where there is the potential for an emergency incident involving hazardous substances. Cleanup operations--including corrective actions and post-emergency response cleanup--are covered by 1910.120(b) through (o). For further guidance, refer to the forthcoming directive on 29 CFR 1910.120.]

II. QUALITY CRITERIA REFERENCES

A. 1910.119(n) D. 1910.165 B. 1910.38(a) E. 1910.1200 C. 1910.120(a),(p),(q) F. 1910.36(b)

III. VERIFICATION OF PROGRAM ELEMENTS

A. Records Review

1. Has an emergency action plan been established and implemented for the entire plant in accordance with the requirements of 1910.38? Does the plan address the following: [Criteria Reference .119(n) or .38(a)(2)] * Escape procedures and routes? * Procedures for post-evacuation employee accounting? * Preferred means to report emergencies? * Duties and procedures of employees who: * Remain to operate critical equipment? * Perform rescue

and medical duties? * The names for persons or locations to contact for more action plan information? * Employee alarm systems?

2. Is the plan written if the facility has more than ten employees? [Criteria Reference .38(a)(1)]

3. Is there sufficient number of persons designated and trained to assist in the safe and orderly emergency evacuation of employees? [Criteria Reference .38(a)(5)(i)]

4. Is the plan reviewed with each employee covered by the plan: initially when the plan is developed; and whenever the employees' responsibilities or designated action under the plan change; and whenever the plan is changed? [Criteria Reference .38(a)(5)(ii)]

5. Does the emergency action plan cover procedures for handling small releases? [Criteria Reference .119(n)]

6. Is an alarm system established and implemented which complies with 1910.165? Are the alarms: [Criteria Reference .165(b-e)]

* Distinctive for each purpose of the alarm?

* Capable of being perceived above ambient noise and light levels by all employees in the affected portions of the workplace?

* Distinctive and recognizable as a signal to evacuate the work area or perform actions designated under the plan?

* Maintained in operating condition?

* Tested appropriately and restored to normal operating condition as soon as possible after test? * Non-supervised systems tested not less than every two months? * Supervised systems tested at least annually?

* Serviced, maintained, and tested by appropriately trained persons?

* Unobstructed, conspicuous and readily accessible, if they are manual alarm systems?

7. Does the written emergency response plan meet the requirements of 1910.120(a), (p), and (q), if appropriate? [Criteria Reference .120(a); 120(p); 120(q)]

(See the NOTE at I., Program Summary. Clean-up operations required by a governmental body are addressed in .120(a); treatment, storage, and disposal (TSD) facilities under the Resource Conservation and Recovery Act are addressed in .120(p); and .120(q) addresses requirements for emergency response no matter where they occur, except that it does not cover employees engaged in operations at TSD facilities or hazardous waste sites.)

8. If employees are engaged in emergency response (except clean-up operations), does the plan address the following: [Criteria Reference .120(q)] * Coordination with outside parties? * Personnel roles, lines of authority, training, and communication? * Emergency recognition and prevention? * Safe distances and places of refuge? * Site security and control? * Evacuation routes and procedures? * Decontamination? * Emergency medical treatment and first aid? * Emergency alerting and response procedures? * Critique of response and followup? * PPE and emergency equipment?

B. On-site Conditions

1. Do observations of a representative sample of alarm systems indicate that they comply with the requirements in .165(b-e)? Are the alarms: [Criteria Reference .165(b-e)] * Distinctive for each purpose of the alarm? * Capable of being perceived above ambient noise and light levels by all employees in the affected portions of the workplace? * Distinctive and recognizable as a signal to evacuate the work area or perform actions designated under the plan? * Maintained in operating condition? * Tested appropriately and restored to normal operating condition as soon as possible after test? (Be present for an alarm test if possible or review video if available.) * Tested no greater than every two months? * Serviced, maintained, and tested by appropriately trained persons? * Unobstructed, conspicuous and readily accessible, if they are manual alarm systems?

2. Do observations of the evacuation routes indicate that they are not blocked, locked, or barricaded? [Criteria Reference .36(b)(4)]

3. Do observations of the evacuation routes indicate that there are readily visible signs for evacuation routes leading to safe locations? [Criteria Reference .36(b)(5)]

4. Do observations of a representative sample of the evacuation route signs during dark conditions indicate that they are adequately illuminated? [Criteria Reference .120(b)(6)]

C. Interviews

1. Based on interviews with employees who have been identified as likely to discover releases or assigned other emergency response duties, are they provided training? Is the training based on the duties they are expected to perform? [Criteria Reference .120(q)(6)]

2. Based on interviews with employees who are likely to discover hazardous substance releases, can they demonstrate competency in the provisions listed in the first responder awareness level: [Criteria Reference .120(q)(6)(i)] * Understanding what hazardous substances are, and the risks associated with them in an incident? * Understanding potential outcomes associated with an emergency when hazardous substances are present? * Ability to recognize the presence of hazardous substances in an emergency? * Ability to identify the hazardous substances, if possible? * Understanding the role of the first responder awareness individual in the employer's emergency response plan, including site security and control and the U.S. Dept. of Transportation's Emergency Response Guidebook? * Ability to realize

the need for additional resources, and make appropriate notifications to the communication center?

3. Based on interviews with employees who will take defensive action in containing and controlling a release as part of the response, can demonstrate the competencies for a first responder operations level: [Criteria Reference .120(q)(6)(ii)] * Knowledge of the basic hazard and risk assessment techniques? * Knowledge of how to select and use proper PPE provided to them? * Understanding of basic hazardous materials terms? * Knowledge of how to perform basic containment, confinement, and control operations within the capability of their unit? * Knowledge of how to implement basic decontamination procedures? * Knowledge of relevant standard operating procedures and termination procedures for a response?

4. Based on interviews with employees who will take offensive action in containing and controlling a release as part of the response, can they demonstrate the competencies for a hazardous materials (HAZMAT) technician: [Criteria Reference .120(q)(6)(iii)] * Knowledge of how to implement the employer's emergency response plan? * Knowledge of the classification, identification, and verification of known and unknown materials using field survey instruments and equipment? * Ability to function within an assigned role in the Incident Command System? * Knowledge of how to select and use proper Specialized chemical PPE provided to them? * Understanding of hazard and risk assessment techniques? * Ability to perform advanced control, containment, and/or confinement operations within the capability of their unit? * Understanding of how to implement decontamination procedures? * Understanding of termination procedures? * Understanding of basic chemical and toxicological terminology and behavior?

5. Based on interviews with a representative number of operator and maintenance employees, do they know the emergency action plan to protect themselves in an emergency? [Criteria Reference .38(a)]

1910.119(o): COMPLIANCE AUDITS

I. PROGRAM SUMMARY

The intent of this paragraph is to require employers to self-evaluate the effectiveness of their PSM program by identifying deficiencies and assuring corrective actions. Minimum requirements include: audits at least every three years; maintenance of audit reports for at least the last two audits; audits conducted by at least one person knowledgeable in the process; documentation of an appropriate response to each finding; documentation that the deficiencies found have been corrected.

II. QUALITY CRITERIA REFERENCES

A. 1910.119(o): compliance Audits B. 1910.119(c): Employee Participation

III. VERIFICATION OF PROGRAM ELEMENTS

A. Records Review

1. Has the employer certified in writing that there has been an audit of compliance with PSM at least every three years? [Criteria Reference .119(o)(1)]

2. Do the audit reports include an evaluation of all the required paragraphs of the PSM standard? [Criteria Reference .119(o)(1)]

3. Was the compliance audit conducted by at least one person who was knowledgeable in the process? [Criteria Reference .119(o)(2)]

4. Has a report of the findings been developed for each audit? [Criteria Reference .119(o)(3)]

5. Has the employer promptly determined and documented and appropriate response to each of the findings? [Criteria Reference .119(o)(4)]

6. Does the employer document that deficiencies have been corrected? [Criteria Reference .119(o)(4)]

7. Has the employer retained the two most recent compliance audit reports? [Criteria Reference .119(o)(5)]

B. On-site Conditions

No observations are required; on-site Conditions will be cited under other paragraphs. [Criteria Reference .119(o)(4)]

C. Interviews

1. Based on interviews with auditors, are they knowledgeable in processes? [Criteria Reference .119(o)(2)]

2. Based on interviews with a representative number of employees and their designated representatives, do they have access to compliance audit information? [Criteria Reference .119(o)(3)]

1910.119(p): TRADE SECRETS

I. PROGRAM SUMMARY

The intent of this paragraph is to require employers to provide all information necessary to comply with the standard to personnel developing paragraphs (d), (e), (f), (n) and (o) without regard to possible trade secrets. In addition, employees and their designated representatives

shall have access to trade secret information contained within documents required to be developed by the standard.

II. QUALITY CRITERIA REFERENCES

A. 1910.119(p): Trade Secrets B. 1910.1200: Hazard Communication

III. VERIFICATION OF PROGRAM ELEMENTS

A. Records Review

1. Has all information necessary been provided to those persons responsible for compiling the process safety information (paragraph d), those assisting in development of the PHA (paragraph e), those responsible for developing the operating procedures (paragraph f), and those involved in incident investigations (paragraph m) and emergency planning and response (paragraph n), and compliance audits (paragraph o) been without regard to possible trade secret status of such information? [Criteria Reference .119(p)(1)]

2. Do employees and their designated representatives have access to trade secret information contained in the PHA and to other documents required to be developed by the standard, subject to the provisions set forth in 1910.1200(i)(1) through (i)(12)? [Criteria Reference .119(p)(3)]

B. On-site Conditions

Not applicable.

C. Interviews

Employees involved in specific duties: 1. Based on interviews with a representative number of employees involved in compiling the process safety information, developing PHA's, developing operating procedures, investigating incidents, planning and responding to emergencies, and auditing compliance, has all information necessary been provided to them without regard to possible trade secret status of such information? [Criteria Reference .119(p)(1)]

Employees and Representives: 2. Based on interviews with a representative number of employees and their designated representatives, do they have access to trade secret information contained within the PHA and other documents required to be developed by the standard? [Criteria Reference .119(p)(3)]

(Note that this access is subject to the provisions set forth in 1910.1200(i)(1).)

Appendix B

Clarifications and Interpretations of the PSM Standard

The guidance contained in this appendix is provided for compliance assistance. It shall be followed in interpreting the PSM standard for compliance purposes. Unless otherwise noted, all paragraph citations refer to 29 CFR 1910.119.

This appendix contains clarifications agreed to in a settlement agreement dated April 5, 1993, between OSHA, the United Steelworkers of America, the Oil, Chemical and Atomic Workers International Union, and the Building and Construction Trades Department of the AFL-CIO. The settlement agreement clarifications reflect modifications jointly and cooperatively agreed to by the above parties and by the Chemical Manufacturers Association, the American Petroleum Institute, the Dow Chemical Company, and the National Petroleum Refiners Association.

Where possible, clarifications and interpretations have been presented in a question-and-answer format.

NOTE: OSHA plans to include additional clarifications and interpretations in this appendix through future page changes to this instruction.

(a) Application

(a) Registration

Do covered establishments have to register with OSHA?

No. There is **no** requirement that establishments covered by the standard register with or otherwise notify OSHA.

(a) Explosives--fireworks manufacture

How does the PSM standard apply to pyrotechnics (fireworks) and explosives?

The PSM standard amended the scope of 29 CFR 1910.109, Explosives and blasting agents, by revising paragraph (k), which requires that the manufacturer of explosives and pyrotechnics comply with 29 CFR 1910.119. As defined at 1910.109(a)(10), pyrotechnics are commonly referred to as fireworks. Employers who manufacture explosives and fireworks must comply with both 29 CFR 1910.109 and 1910.119.

The applicability of 29 CFR 1910.109 to employers who manufacture fireworks is delineated in OSHA Instruction CPL 2.73, Fireworks Manufacturers: Compliance Policy. In accordance with that directive, a fireworks plant employer can be cited for violation of 29 CFR 1910.109 with reference to certain National Fire Protection Association (NFPA) standards in NFPA 1124, Code for the Manufacture, Transportation and Storage of Fireworks.

What is the role of the Bureau of Alcohol, Tobacco and Firearms (BATF) vis-a-vis the PSM standard and fireworks manufacture?

By 27 CFR 55 Subpart K, BATF regulates the storage, including minimum distances, of explosive materials including fireworks in the workplace. As such, BATF limits the amount of special fireworks, pyrotechnic composition, and explosive materials used to assemble fireworks in processing building to no more than 500 pounds. Also, the maximum quantity of flash powder permitted by BATF in any fireworks process building is 10 pounds. These BATF limitations should not be confused with the applicability of the PSM standard to **any** amount of fireworks being manufactured.

(a) Laboratories

Does the PSM standard apply to laboratory and research operations?

A laboratory or research operation involving at least the threshold quantity of one or more highly hazardous chemicals is subject to the PSM standard.

(a) Flammable liquids

Are processes involving flammable liquids (e.g., ethyl alcohol) covered by the standard?

Processes involving flammable liquids (e.g., in a distillation process) in quantities at or above 10,000 lbs. are covered. Quantities of flammable liquids in storage are considered a part of the process if the storage tanks are interconnected with the process, or if they are sufficiently near the process that an explosion, fire, or release could reasonably involve the storage area combined with the process in quantities sufficient to meet the threshold amount of 10,000 lbs.

Flammable liquids that are stored on a tank farm (e.g., a wholesale gasoline regional tank farm) where only transferring and storage are done are not covered by the PSM standard. They are, however, covered under 1910.106.

(a)(1)(i) Hydrogen chloride (HCL)

Does the PSM standard apply to muriatic (32% HCL) acid?

The chemical names: hydrogen chloride (HCL) and anhydrous hydrochloric acid are included in the highly hazardous chemicals listing in Appendix A of the PSM standard. Anhydrous (without water) hydrochloric acid is hydrogen chloride. Both hydrogen chloride and anhydrous hydrochloric acid are identified by the same Chemical Abstract Service (CAS) Number 7647-01-0, as denoted in Appendix A. Hydrochloric acid (muriatic acid)--i.e., a solution of hydrogen chloride gas in water--is not listed in Appendix A and therefore is not considered to be a highly hazardous chemical subject to the PSM standard.

(a)(1)(i) Highly hazardous chemicals (HHCs)

What is meant by "Formaldehyde (Formalin)" listed in Appendix A of the PSM standard?

This highly hazardous chemical should be listed to read: Formaldehyde (37% by weight or greater). The PSM standard will be revised to reflect this change in the near future. Any amount of mixture of Formaldehyde, less than 37%-by weight, in solution would not be covered by the PSM standard.

Does the PSM standard apply to solutions of Dimethylamine?

Anhydrous Dimethylamine, identified by Chemical Abstract Service (CAS) Number 124-40-3, is listed in Appendix A of the PSM Standard as a highly hazardous chemical. Dimethylamine in aqueous solutions, which is not listed in Appendix A, is not considered to be a highly hazardous chemical covered by the PSM standard except when the solution qualifies as a flammable liquid.

(a)(1)(i) HHCs--mixtures

Does the threshold quantity listed under Appendix A of the PSM standard apply to the quantity of the whole mixture or just the quantity of the component chemical, or to neither (i.e., does the threshold quantity apply only to quantities of pure chemical unless otherwise specified in the appendix)?

The threshold quantities listed in Appendix A of the standard apply only to pure (or "commercial grade") chemicals unless otherwise specified, for example, Hydrogen Peroxide, 52% by weight or greater.

Does the PSM standard apply to an employer who uses cellulose nitrate in a concentration greater than 12.6% nitrogen to which water is added, producing a mixture containing greater than 23% water, which will not burn?

Appendix A of the standard lists cellulose nitrate in concentrations of greater than 12.6% nitrogen as a chemical which presents a potential for a catastrophic event at or above the threshold quantity of 2500 pounds (1,133.9 kg). The standard does not distinguish between "wet" or "dry" cellulose nitrate.

Therefore, if an employer's process involves cellulose nitrate in a concentration greater than 12.6% nitrogen, with the total quantity of the mixture or solution at or above the threshold quantity--no matter what percentage of water may be used in treatment--the process is covered under the requirements of the PSM standard.

(a)(1)(i) and (b) Covered process--Hazardous waste operations

Does the PSM standard apply to the EPA-regulated and permitted RCRA hazardous waste treatment, storage and disposal (TSD) facilities, when such facilities keep on-site in one location a hazardous waste chemical in a concentration and quantity which exceeds the applicable threshold quantity of Appendix A. If so, why? If not, why not?

Employers of worksites with TSD facilities which contain covered processes must comply with the PSM standard. The requirements of the PSM standard are intended to eliminate or mitigate workplace catastrophic releases of highly hazardous chemicals and resulting employee exposure to explosion, fire and toxic hazards.

(a)(1)(i) and (b) Covered process--dispersal of inventory

Can an employer who keeps threshold quantities of highly hazardous chemicals listed in Appendix A to 29 CFR 1910.119, such as ammonia, separated into smaller lots and used and stored in separate systems or locations, be exempt from the requirements of the PSM standard?

From a storage standpoint, the 1910.119 standard would not apply to an employer who segregates his inventory by dispersing storage of highly hazardous chemicals, such as ammonia, in amounts which do not exceed the threshold quantity so that a release from one storage area would not contribute to or cause a release from others around the workplace. Additionally, an employer could reduce his on-site inventory of highly hazardous chemicals by ordering more frequent, smaller shipments so that they do not exceed the threshold quantities set forth in the PSM Standard.

The PSM standard's non-mandatory Appendix C suggests that, if reduced inventory of highly hazardous chemicals is not feasible, an employer might consider dispersing inventory to several locations on-site. When are such materials to be considered part of a single process?

Under the definition of "process" provided at 29 CFR 1910.119(b), any group of vessels which are interconnected and separate vessels which are located such that a highly hazardous chemical could be involved in a potential release shall be considered a single process. Inventories of highly hazardous chemicals would not be considered to be adequately dispersed if the storage vessels are connected with or in proximity to a covered process such that they could be involved in a potential release.

What evaluation techniques are appropriate to determine adequate separation distances?

OSHA has not developed, nor is it aware of, any standard evaluation technique to determine adequate distances to separate chemical inventories. If an employer chooses to disperse highly hazardous chemicals on-site, the separation distances would have to be determined on

a case-by-case basis, considering such factors as the nature of the chemicals and covered processes, total inventories, threshold quantities of pertinent chemicals, and facility layout.

(a)(1)(ii) Application--55-gallon drums

Would more than 10,000 pounds (4535.9 kg) of a flammable liquid stored together in 55-gallon (209-liter) drums be covered under the PSM standard?

For the purposes of the PSM standard, this would be considered exempt as storage in atmospheric tanks (notwithstanding the definitions of "containers" and "tanks" in 29 CFR 1910.106), unless the drums are near a covered process, as described in the Q & A on "flammable liquids" at page B-2 of this appendix. For the purposes of 1910.106, 55-gallon (209-liter) drums are covered in the definition of "container."

(a)(1)(ii) Covered Process--Flammable gases

For processes involving flammable gas mixtures, are the non flammable components in a flammable gas mixture included when determining the threshold quantity?

The non-flammable components contribute to the determination of threshold quantity, i.e., 10,000 pounds (4535.9 kg) or greater amounts of a flammable gas, as defined in 29 CFR 1910.1200(c) and noted below:

Gas, flammable means:

(a) A gas that at ambient temperatures and pressure forms a flammable mixture with air at a concentration of thirteen (13) percent by volume or less; or

(b) A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than twelve (12) percent by volume, regardless of the lower limit.

(a)(1)(ii) Covered process--Flammable liquids

Does the PSM standard apply to processes in a paint manufacturing facility, which include the mixing and blending of flammable liquids with other raw materials, and which typically involve few or no chemical reactions? Typically, the flammable products are processed below their normal boiling points and that several large batch vessels are located near each other, with an aggregate weight above the threshold quantity of 10,000 pounds (4535.9 kilograms).

The requirements of the PSM standard would apply to such operations. The exemption provided in the standard at 1910.119(a)(1)(ii)(B) for situations involving flammable liquids applies only when such liquids are being stored in atmospheric tanks (where the tank pressure does not exceed 0.5 pounds per square inch gauge [p.s.i.g.]) or transferred and the liquids are kept below their normal boiling point without benefit of chilling or refrigeration.

This exemption does not apply to a mixing and blending operation related to paint manufacturing.

(a)(1)(ii)(A) Application--Exceptions--Hydrocarbon fuels

Does the PSM standard apply to ceramic manufacturing facilities utilizing propane in amounts exceeding 10,000 pounds as the fuel for firing ceramic ware in a process which does not involve any other highly hazardous chemicals?

No. The PSM standard would not apply to such a situation.

Does gasoline used as a fuel to test run inboard and outboard engines fall within the scope of the PSM standard?

Gasoline used in such a manner does not fall within the scope of 1910.119, because it is used as a fuel in this situation and thus meets the exception at

1910.119(a)(l)(ii)(A). However, other OSHA standards, such as 1910.106, Flammable and combustible liquids, would apply.

Does the PSM standard apply to a plant that has more than 10,000 pounds of hydrocarbon fuel on site where the fuel is used solely as a fuel for a furnace used to melt glass?

The requirements of 1910.119 do not apply to this situation because 1910.119(a)(1)(ii)(A) of the standard specifically excludes from coverage hydrocarbon fuels used solely for workplace consumption as a fuel if the fuel is not part of a process containing another highly hazardous chemical covered by the standard.

(a)(1)(ii)(A) Tote tanks

350-gallon tote tanks containing flammable liquids are used at a facility to refuel vehicles. Are they covered by the standard?

No. 1910.119(a)(1)(ii)(a) exempts hydrocarbon fuels used solely for workplace consumption as a fuel (e.g., gasoline for vehicle refueling) if such fuels are not part of a process containing another highly hazardous chemical covered by the standard. They are, however, covered under 1910.106.

(a)(1)(ii)(A) Fuels for heating

Are flammable liquids and gases used as fuels for such items as heaters or exchanges contained in (covered) processes also included within the coverage of the standard?

Furnaces, boilers, heaters, etc., fueled by flammable liquids or gases--regardless of the quantity of the fuel--used in processes that are otherwise covered by the PSM standard (i.e.,

the existence of a threshold quantity of another highly hazardous chemical) are considered part of the process and are covered by the PSM standard. Flammable liquid-or-gas-fueled furnaces, boilers, etc., used in processes not otherwise covered by the PSM standard are exempt from the standard.

(a)(1)(ii)(B) Tank farms

Are flammable liquids stored in a tank farm covered under the standard?

Atmospheric tanks containing flammable liquids at bulk transfer terminals are not covered. However, atmospheric tanks containing flammable liquids that have feeder connections to processes **are** covered by the standard.

EXAMPLE. Atmospheric tanks in an outside storage area contain a flammable liquid that is pumped to a mixing vessel. If the total quantity of flammable liquids in this equipment is at or above 10,000 pounds (4535.9 kg), then this is a covered process which includes, at a minimum, the storage tanks, the piping, and the mixing vessel.

(a)(1)(ii)(B) Flammable liquids

Does 1910.119(a)(l)(ii)(B) exempt all flammable liquids stored or transferred which are kept below their normal boiling point without the benefit of chilling or refrigeration, including, but not limited to, flammable liquids in atmospheric tanks?

No. The exemption is limited to flammable liquids stored in atmospheric tanks or transferred which are kept below their normal boiling point without benefit of chilling or refrigeration. This exemption is applicable to flammable liquids in tanks, containers and pipes used only for storage and transfer (to storage), and not connected to a process or a process vessel. Similarly, stored flammable liquids in containers, including cans, barrels and drums, would be exempt from coverage by the PSM standard. We recommend you carefully consider the definition of "process" to determine further applicability of the PSM standard in situations where flammable liquids are stored in tanks or containers at a worksite.

(a)(2)(i) Retail facilities

What is the definition of "retail facilities" that are exempted from coverage by the PSM standard?

With respect to enforcement of the PSM standard, a **retail facility** means an establishment that would otherwise be subject to the PSM standard at which more than half of the income is obtained from direct sales to end users.

If an employer that would otherwise be covered by the PSM standard operates at several locations and the majority of its income comes from sales to end users, is the employer exempt as a "retail facility"?

The PSM standard defines a retail facility as "an establishment which would otherwise be subject to the PSM standard, at which more than half of the income is obtained from direct sales to end users." If such an employer operates at multiple locations, the questions becomes whether this constitutes a single "establishment" for the purposes of the standard.

The intent of the PSM Standard is to prevent catastrophic releases of highly hazardous chemicals, thereby, providing for safe and healthful workplaces for employees. Consistent with this intent, the term "establishment," when used to define retail facility, means a company name at a specific site (normally with a street address). Thus, if an employer operates at several locations, some might be covered by the standard, and others not affected.

Are facilities that fill propane tanks for "will call" type customers exempt from the PSM standard? Most of these facilities are under the aggregate quantity of 10,000 pounds (4535.9 kilograms), The majority of the business is transferring propane from the supply tank to small containers for barbecues and "RV" units.

Such facilities appear to be exempt from coverage by the PSM standard because they are retail facilities or because they do not involve processes with threshold (or greater) quantities of propane. A retail facility is defined as a site-specific establishment which otherwise would be subject to the PSM standard, at which more than half of the income is obtained from direct sales to end users.

(a)(2)(ii) Oil or gas well operations

Are single well processing facilities with equipment including separators, heat-treaters and storage tanks used in gas production (from non-H2S containing petroleum fluids) operations exempt from coverage under 1910.119(a)(2)(ii), which excludes oil and gas well drilling and servicing operations?

The 1910.119(a)(ii) exemption of oil or gas well drilling or servicing operations is intended to cover all drilling operations and any well servicing operation including acidizing. Additionally, water separation facilities adjacent to or near the well (including tanks used primarily for water separation in conjunction with oil or gas well production) are not normally covered by the PSM standard.

The following processes, when they involve at least threshold quantities of oil or gas, are covered by the PSM standard. Oil or gas well production fluids from several wells are processed by heating the fluids and physically separating the water from the gas or oil. The water is returned to the ground via a "down hole well" for disposal return to the strata from which it came. But if these oil or gas well drilling operations take place at "normally unoccupied remote facilities", then according to 1910.119(a)(2)(iii), they are exempt from PSM standard coverage.

(a)(2)(iii) Meaning of "facility"

Can a facility contain more than one process?

A facility can include multiple processes. If multiple processes are interconnected, they may be considered a single process for purposes of the standard.

(b) Definitions

(b) "Process"

What are "aggregate threshold quantities"?

In accordance with the second sentence of the definition of "process," quantities of a particular hazardous chemical contained in vessels that are interconnected--and in unconnected vessels that may be adversely affected due to an incident at a nearby process--must be combined to determine whether the threshold level of a hazardous chemical has been reached. If the threshold level is exceeded by the combination of the amount in separate tanks and interconnected vessels, then all of these may be considered one process.

Is waste burning of covered solvents considered a process?

Yes.

(b) "Hot work"

"Spark-producing operations" include operations which use flame-or spark-producing equipment--such as grinders, welding, burning, or brazing--that are capable of igniting flammable vapors or gases.

(b) "Normally unoccupied remote facility"

"Normally unoccupied remote facility" means that employees are not permanently stationed at the remote location. This includes those sites for which periodic visits by employees may be made on a scheduled basis. Examples could include pump stations located miles from the main establishment. Employees may be assigned to check on the station as needed.

The intent behind "remote" is that, due to the isolation of the process from employees by distance, such employees would not be affected by the consequences of a catastrophic release. Therefore, the remote location must be geographically separated from other facilities and employees such that employees would not be affected by an explosion, vapor cloud of toxic gas, or other consequence of an uncontrolled release at the remote site.

(c) Employee participation

(c) Employee participation

In implementing employee participation as required by 1910.119 (c) of the PSM standard, can an employer mandate that employees e.g., top operators of process units--provide the company with information such as step-by-step procedures for routine tasks performed on their operating units? Can the employer threaten disciplinary action for employees who do not cooperate?

The employee participation called for at 1910.119(c) is intended to provide for a cooperative participatory environment and necessary flow of information from management to employees and from employees to management on process safety to eliminate or mitigate the consequences of catastrophic releases of highly hazardous chemicals in the workplace. Paragraph 1910.119(c)(2) contains language taken from the Clean Air Act Amendments (CAAA) of 1990. As prescribed by the CAAA, the standard at 1910.119(c)(3) requires that PSM information developed by the employer be made available to employees and their representatives. Also, OSHA requires that an employer carefully consider and structure the plant's approach to employee involvement in the PSM program.

The plan-of-action standard at 1910.119(c)(1) is intended to address this issue to ensure that the employer actively considers the appropriate method of employee participation in the implementation of the PSM program in the workplace.

(c)(2) Consultation

What does consult mean? Can the employer simply inform the employees?

Consultation refers to a two-way dialogue between the employer and the employees and their representatives (where they exist), in which the employer elicits, and responds to, employees' concerns and suggestions bearing upon the elements of process safety management required under this standard. Consultation is therefore more than a way to inform employees about aspects of process safety; it is a process of seeking advice, criticisms, and suggestions from employees and their representatives.

1. The employer should establish a method for informing all employees and their representatives that their process safety concerns and suggestions are welcome. The employer must also establish a mechanism by which it will respond, orally or in writing, to such concerns and suggestions.

2. In addition, the employer should affirmatively solicit the suggestions and concerns of employees and their representatives, who, by virtue of their job responsibilities, actual knowledge, or representative positions, can reasonably be expected to make substantive contributions to the development and evaluation of specific elements of process safety management.

The standard requires employers to consult with "employees and their representatives." Is the term broad enough to include a representative of the international union? A consultant designated by the union local or international?

The standard requires consultation with "**employees and their representatives"**. The term "**employee representative**" is intended to mean **union representative** where a union exists, or an employee designated representative in the absence of a union. The term is to be construed broadly, and may include the local union, the international union, or an individual designated by these parties, such as the safety and health committee representative at the site or a non-employee consultant. In the absence of a union, employees have a right under the standard to designate a representative to participate in the consultation process.

With respect to the PHA team, in all cases it must consist of one or more persons **knowledgeable about** the process. The intent of the consultation requirement at 1910.119(c)(2) is not to compel the inclusion of any person(s) who are not knowledgeable; ideally, the employer and employees/employee representatives should reach a consensus on including the most capable parties.

(c)(2) Consultation--contractors

Must the employer consult with employees of contractors?

A host employer must consult with employees of covered contractors and their representatives, to the same extent that it must consult with similarly situated direct hire employees. Therefore, the host employer must establish a method for informing all contractor employees and their representatives that their process safety concerns and suggestions are welcome, and will be responded to. In addition, the following non-exclusive examples illustrate circumstances under which the host employer may be required to solicit the advice and suggestions of specific contractor employees about specific aspects of process safety:

1. Contract employees who function as process operators on covered processes, or perform routine maintenance on covered processes, should be consulted to the same extent as equivalent direct hire operating and maintenance employees, respectively.

2. Contract employees who routinely interface with a host employer's Management of Change program should be consulted on the effectiveness of the program as it relates to their jobs and based upon their interaction with it.

3. Contract employees who routinely participate in activities pursuant to mechanical integrity should be consulted on the effectiveness of the program as it relates to their jobs and based upon their interaction with it; e.g., contract employees should be encouraged to identify any deficiencies they observe in the host employer' s program.

4. Contract employees who have unique experience or knowledge concerning the operation, maintenance, or safe performance of any portion of a covered process should be consulted, as appropriate, on that portion of the process during the PHA.

5. Contract employees who routinely interface with the host employer's safe work practices (such as, for example, the employer's lockout/tagout rules, hot work permit procedures, and

confined space entry procedures) should be consulted as to the effectiveness of those practices.

Host employers can consult with contractor employees and their representatives directly, or through the contractor employer. Contractor employers share responsibility for ensuring that there is consultation with their employees.

(c)(3) Access

What does "access" mean? Does this mean simply make it available at a central location? Does the employer have to make copies for employees if requested?

The intent of **access** under this standard is for the information to be made available for employees and their representatives in a reasonable manner. Reasonable access may require providing copies or loaning documents. The trade secret provision of the standard permits the employer to require confidentiality agreements before providing the information.

(c)(3) Equal access to information

Under (c)(3), the employer is required to provide access to process hazard analyses and all other information to be developed under this standard to employees of covered contractors, to the same extent that it must provide access to direct hire employees, if similarly situated. Contract employers share responsibility for assuring that their employees are provided with the requested information.

(d) Process safety information

(d) Retention of information

How long must the employer maintain process safety information?

In order to demonstrate compliance with this paragraph, and to meet the purpose of the standard, the process safety information is to be kept for the lifetime of the process, and updated whenever changes other than "**replacement in kind**" are made.

(d)(2)(ii) Original process safety information not present

If process safety information on the original technology does not exist, what must the employer do?

The employer must obtain or generate the missing information. If the information on the original technology does not exist, then the employer may delay the development of this information until the process hazard analysis (PHA) is initiated, but in no case later than the applicable dates specified at 1910.119(e)(1). However, the other information required by this section must be compiled before conducting any PHA. The information on the technology

must be gathered as the PHA's are conducted in accordance with the priority schedule developed by the employer.

(d)(3)(iii) Older codes--PSM standard deadlines

For equipment based on old design codes, the employer must determine and document that the equipment is designed and operated safely. By what date must the employer do this? Specifically:

*** When must the employer determine adequacy of design based on old codes, and**

*** How much time does the employer have to make corrections?**

Generally speaking, the time frames which apply to implementation of the PHA's also apply to this paragraph.

Such documentation must be completed either before or in conjunction with the development of the PHA, except where a pre-startup safety review is required, in which case the documentation must be completed before startup. For older equipment, this may require verification that the design and construction are safe for the intended application. Where corrective action is required as a result of the PHA, it must be completed as soon as possible pursuant to paragraph (e)(5).

EXCEPTION: For actions required by a pre-startup safety review (see (i)(2)), such corrective action must be implemented prior to the startup if the correction is safety-critical.

(e) Process hazard analysis

(e)(1) PHA priority

What rationale must employers use to determine the priority for conducting the process hazard analyses? May the rationale include age, history, extent of employee exposure, etc.?

The appropriate priority for conducting PHA's is to be determined by using all of the criteria identified in this paragraph, e.g., extent of the process hazards (catastrophic potential), age of the process, number of potentially exposed employees, and operating history. Other appropriate factors may also be considered in establishing the priority. The documentation required by this paragraph shall demonstrate the underlying rationale for the prioritization.

(e)(1) PHA priority--"as soon as possible"

Paragraph (e) contains a five year phased-in compliance schedule for completing process hazard analyses. The provision mandates that employers first "determine and document the priority order for conducting process hazard analyses" and then complete 25 percent or more of the analyses each year after the second year. (See 57 Fed. Reg. 6378/3.) However,

because OSHA believes that "plants with a limited number of processes, with simple processes, or which have already completed a number of process hazard analyses" will need less time to complete their analyses (57 Fed. Reg. 6375/3), it included a specific provision requiring that analyses "be completed as soon as possible." 29 C.F.R. 1910.119(e)(1)

(e)(1) PHA completion dates

What is the time frame for completion of the initial PHAs and for updating and revalidating them?

In accordance with 1910.119(e)(l), all initial PHAs must be completed as soon as possible, with at least 25 percent of them completed by May 26, 1994; 50 percent by May 26, 1995; 75 percent by May 26, 1996; and all completed by May 26, 1997. Initial PHAs must be updated and revalidated at least every 5 years thereafter (see 1910.119(e)(6). When employers update and revalidate a PHA before the 5-year deadline, the subsequent update and revalidation must be completed within the next 5-year period.

(e)(1) PHAs--Required site-by-site?

If a natural gas company has five sites with facilities performing the same process, does a separate PHA need to be performed for each site, for each facility at these sites, or for each process at each facility?

The PSM Standard is applicable, on a site-by-site basis, to each worksite which has one or more facilities containing one or more processes involving one or more of the covered highly hazardous chemicals. A worksite may be simply one facility containing a single process. (See the definition of "facility" in Subsection (b) of 1910.119). On the other hand, a worksite may be a complex of facilities, each containing one or more processes.

Under 1910.119(e)(l), employers are required to perform initial PHAs on processes involving highly hazardous chemicals covered by the PSM standard. An employer may use a generic hazard analysis approach for the same (or nearly the same) covered process at an individual worksite. The employer must account for variations (e.g., differences in siting, incident histories, technology, equipment, or operations) for each process covered by this generic approach. Generic process hazard analysis is addressed in section 4. of nonmandatory Appendix C of 1910.119, Compliance Guidelines and Recommendation for Process Safety Management.

(e)(2) Process hazard analysis--"appropriate methodology"

What type of methodology must employers use in the PHA in order to be sure it is "appropriate"?

Employers are expected to use sound judgment, on a case-by-case basis, to determine an appropriate methodology for the process hazard analysis for each covered process. It is not the intent of the standard to require a PHA methodology that is excessively burdensome, but

rather one that is appropriate and which will have the capability to elicit all hazards, defects, failure possibilities, etc., for the process being analyzed, and also have the capability to address all the factors at 1910.119(e)(3).

(e)(3) Meaning of "control"

The regulation requires that the PHA address the "control" of the hazards. What is meant by: "identification, evaluation, and control of process hazards"--?

The PHA is intended to identify and evaluate acceptable controls for process hazards. The evaluation of the hazards must include all the steps set out in section (e)(3)(i) -vii), using a methodology consistent with section (e)(2). Through the timely resolution of the PHA findings and recommendations, the PHA is intended to control process hazards.

(e)(3)(iv) Quantitative determination?

Must the employer make a quantitative determination to determine the consequences of failure of the controls?

The intent of this paragraph is to require the employer to at least identify each type of control as well as identify the possible effects of the failure of the listed control. OSHA believes employers can determine the consequences of a failure of these controls, and establish a reasonable estimate of the safety and health effects on employees without conducting a specialized quantitative evaluation.

(e)(3)(v) Facility siting

What does "facility siting" mean?

With respect to existing plants, "siting" does not refer to the site of the plant in relation to the surrounding community. It refers, rather, to the location of various components within the establishment.

(e)(5) Abatement = shutdown?

Hazards may be identified for which a recommended solution/action might be the shutdown of the process. For example, several processes might be located very close, and if fire were to occur a domino effect might result in a catastrophic release. The resolution may be to separate the processes, but there is no additional property on which to expand. What is required of the employer?

In such situations, the employer could implement protective measures to minimize the probability of a major uncontrolled release. An appropriate response in this specific case, for example, might be to install additional detection systems which may be interlocked to deluge systems for tanks and process equipment, to provide additional protective measures

for onsite personnel, and to implement administrative controls, such as reducing inventories and numbers of exposed personnel.

(e)(5) Timeliness

Employers must "promptly" address the problems identified in the PHA in a "timely manner," and complete actions "as soon as possible." What time frame did OSHA intend here?

The standard's intent is for the employer to take corrective action as soon as possible. As soon as possible means that the employer shall proceed with all due speed, considering the complexity of the recommendation and the difficulty of implementation. OSHA expects employers to develop a schedule for completion of corrective actions, to document what actions are to be taken, and to document the completion of those actions as they occur.

(e)(5) Addressing PHA team's findings and recommendations

Paragraph (e) of the standard requires that a team with expertise in engineering and process operations conduct a process hazard analysis, containing specific findings and recommendations for each covered process. The employer is then required to promptly "address" and "resolve[]" the team's findings, document the actions taken, and communicate these actions to the affected employees. 29 C.F.R. 1910.119(e)(5).

OSHA considers an employer to have "resolved" the team's findings and recommendations when the employer either has adopted the recommendations, or has justifiably declined to do so. Where a recommendation is rejected, the employer must communicate this to the team, and expeditiously resolve any subsequent recommendations of the team.

An employer can justifiably decline to adopt a recommendation where the employer can document, in writing and based upon adequate evidence, that one or more of the following conditions is true:

1. The analysis upon which the recommendation is based contains material factual errors;

2. The recommendation is not necessary to protect the health and safety of the employer's own employees, or the employees of contractors;

3. An alternative measure would provide a sufficient level of protection; or

4. The recommendation is infeasible.

(e)(7) Retention

How long must the process hazard analyses, updates, and revalidations be retained?

For the life of the process.

(f) Operating procedures

(f)(1) Written operating procedures

Many employers have computerized process control systems and safety interlock systems software. Can simplified loop diagrams or narrative descriptions be used to describe the logic of software and the relationship between the equipment and computerized process control systems, to meet the requirements for written operating procedures at 1910.119(f)(1)? Can system logic flow charts or narrative descriptions of the computerized safety interlock systems be used to meet these same requirements?

It is anticipated that employers would include loop diagrams, flow charts, and narrative descriptions of control and interlock systems in their compilations of written process safety information required by 1910.119(d) before conducting any PHAs required by 1910.119(e). Written operating procedures must be developed to provide clear instructions for safely conducting activities involved in each covered process, consistent with the process safety information and with the associated PHA. Simplified diagrams, flow charts, and narratives could be used in conjunction with instructions to meet the requirements for written operating procedures at 1910.119(f)(1).

(f)(1)(iii)(c) "Control measures to be taken if physical contact or airborne exposure occurs"

Does this mean first aid, or industrial hygiene services?

It primarily means first aid procedures or emergency medical attention, which should be consistent with the information on the material safety data sheet.

(g) Training

(g)(1)(i) Initial training

Training in an overview of the process, and in safety and health hazards, emergency operations, and safe work practices, must have been completed by May 26, 1992. In situations where operating procedures were already in place, training in those existing procedures was required by May 26, 1992. Initial training shall have been provided by that date, based on existing procedures and available process information. As new information and procedures are developed, refresher training must be provided in accordance with paragraph (g)(2).

(g)(1)(ii) Initial training--"grandfathering"

What is required in the employer's written certification regarding employees whose initial training is "grandfathered"?

Where employees involved in operating the process have not received the initial training required under (g)(1)(i), but have been involved in operating the process safely for a period of time prior to May 26, 1992, the employer may waive the initial training requirement by **certifying in writing** that the employee has the required knowledge, skills, and abilities to safely carry out the duties and responsibilities as specified in the operating procedures, written or otherwise. Such certification may be based on on-the-job evaluation or other equivalent determination methods. When new operating procedures--which must be written--are subsequently developed, the employer must give training to operating employees prior to their implementation.

(g)(2) Refresher training

Employees have to be given refresher training at least every 3 years--measured from when?

The time period for refresher training of an employee involved in operating a process is to be measured from the date of the employee's last training [or "grandfathering," as allowed at (g)(1)(ii)] in the overview and current operating procedures of the process.

Under what circumstances must refresher training be provided more often than every 3 years?

Employers, in consultation with employees, shall determine the appropriate frequency, which may be based on consideration of such factors as deviations from standard operating procedures, recent incidents, or apparent deficiencies in training.

Is training under "management of change" considered to be refresher training?

No. It is an independent training requirement, in addition to other training requirements of the standard.

(g)(3) Training documentation

This paragraph requires the employer to make sure that operators "understand" the training provided to them under this section. Is some method of testing required?

There must be some positive means taken by the employer to determine if employees have understood their training and are capable of adhering to the current operating procedures of the process. This could include the administration of a written test, although the standard does not require that a formal written test be used. Other means of ascertaining comprehension of the training, such as on-the-job demonstrations, etc., are acceptable, as long as they are adequately documented.

(h) Contractors

(h) Scope of activities

The list of covered and exempted activities in paragraph (h) is meant to be illustrative of potential contractor activities. The standard covers all contractor activities that have the potential for affecting process safety. Therefore, paragraph (h) applies to all contractor activities on or adjacent to a covered process, except those incidental activities that do not influence process safety, such as janitorial work, food and drink services, laundry, delivery or other supply services. Consequently, contractors performing construction, demolition, equipment installation and other work that bay affect the safety of a covered process must comply with the requirements of this paragraph. Furthermore, paragraph (h) is not the only part of the process safety management standard that applies to contractors. In appropriate circumstances, other provisions of the standard apply.

(h) Scope of activities--construction work

Do contractors performing construction work at a site covered by the PSM standard also have to comply with 29 CFR 1926 standards?

Contractors performing construction work at a site covered by the PSM standard must comply with all applicable standards under 29 CFR 1926, including Part 1926, Subpart C requirements. See the regulation at 29 CFR 1910.12(b), which defines the term "construction work," and the regulation at 29 CFR 1926.13, which discusses the terms "construction," "alteration," and "repair."

(h)(1) and (2) Contractors and subcontractors

Paragraph (h) applies to all subcontractors whose work falls within the scope of covered work as established in (h)(1). The host employer and the general contractors are both responsible for ensuring that the duties contained in (h)(2) are performed; this applies to inquiring into the safety records of their subcontractors, informing the subcontractor as to the known potential hazards, the emergency action plan, and safe work practices, and ensuring the subcontractor's compliance with the standard. Furthermore, under (h)(2)(v), the host employer has the obligation to assure that the contract employer and the subcontractor are properly performing their obligations under (h)(2) with respect to their subcontractors' compliance with the standard.

The intention is that host employers and contractors exercise responsible oversight of their respective contractors' and subcontractors' performance of safety and health requirements under the standard.

(h)(2) Contractors--Employer responsibilities--Training

How much of the burden of training contractor employees is placed on the employer?

The burden of training contractor employees is on the contractor employer. However, under 1910.119(h)(2)(v), the host employer shall periodically evaluate the contract employer's performance with respect to the (contract) employee instruction and training requirements at 1910.119(h)(3).

NOTE: The employer must inform a contract employer of the hazards related to the contractor's work and the process [as noted at 1910.119(h)(2)(ii) and (iii)].

Although the standard places the primary responsibility for providing training to its employees on the contract employer itself, the host employer bears the responsibility to "periodically evaluate the performance of contract employers in fulfilling their obligations as specified in paragraph (h)(3)." 29 C.F.R. 1910.119(h)(2)(v). Such "obligations" clearly include training obligations. The standard also requires the host employer to select a contract employer only after evaluating its safety performance and programs [(h)(2)(i)], and to inform the contract employer about the specific hazards associated with the process [(h)(2)(ii)] and the provisions of the emergency action plan [(h)(2)(iii)].

If contract employees are involved in operating a process or maintaining the on-going integrity of process equipment, then they must receive training in accordance with the specific training requirements set forth in paragraphs (g) and (j), respectively. In order to satisfy its obligations under (h)(2)(v), the host employer must ensure, through periodic evaluations, that the training provided to these contract employees by the contract employer is in fact equivalent to the training that the standard requires for direct hire employees. Such training need not be identical in format or content or context to training given to the host's employees. The critical element is that information required by the standard must be conveyed to and learned by contract employees as well as direct hire employees. The obligation may be satisfied by joint training or by separate training.

Moreover, (h) requires that every employee of a covered contractor be trained in the work practices necessary to perform safely his or her job. The contract employee must be able to perform his or her own job tasks safely and should receive:

(a) training prior to beginning work on or near a covered process, which should encompass (i) instruction regarding known process hazards related to his or her job, including training in the applicable provisions of the emergency action plan; and (ii) training in the safe work practices adopted by the host employer and the contract employer; and

(b) additional training as necessary (i) to prepare the employee for changes in the operations or work practices at the facility and (ii) to ensure that the employees's understanding of the applicable safe work practices and other rules remains current.

(h)(2)(i) Contractors--Employer responsibilities--Selecting a contractor

When selecting a contractor, an employer has to evaluate the potential contractor's safety performance and programs. Must the employer document this? If so, to what extent?

The standard does not require the employer to document the evaluation of the information obtained regarding contractor safety performance and programs. However, OSHA compliance officers are directed to review records about these aspects of the selection process and to determine if the employer has met the intent of this provision. (See Appendix A of this instruction, page A-25.)

(h)(2)(vi) Contractors--Employer responsibilities--Contractor injury and illness log

What type of injury and illness log does an employer have to maintain regarding contract employees?

If the contract employer is willing to share the OSHA 200 log and OSHA 101 first reports of injury (or equivalent) with the employer, and if those logs and reports specifically indicate which injuries and illnesses are related to process areas, then such records would be acceptable to OSHA. Acceptable alternatives would be for the employer to develop a contract employee injury and illness log separately for each contractor, or a combined log for all contractors if the combined log distinguishes among contractors.

(i) Pre-startup safety review

(i)(2)(i) Pre-startup safety review--equipment in accordance with design specifications

The employer is responsible for ensuring that process equipment meets design specifications prior to startup. For equipment that has been modified to the extent that a change to the process safety information is required, the employer must ensure that the process safety information has been modified prior to startup. (Note also the requirements of

1910.119(j)(4)(ii)--Mechanical integrity--Inspection and testing.

(j) Mechanical integrity

(j)(1)(i) Application

"Pressure vessels and storage tanks" **includes** "pressurized" storage tanks; i.e., tanks designed to be used above atmospheric pressure, as well as non-pressurized (atmospheric) storage tanks.

(j)(2) Written Procedures

The purpose of this provision is to require written procedures in adequate detail to ensure that the specific process equipment receives careful, appropriate, regularly scheduled maintenance to ensure its continued safe operation. A "breakdown" maintenance program

(i.e., a program wherein action is taken only when something breaks down) does not meet the requirements of this paragraph.

(j)(2) Written Procedures

Do these written procedures need to be specific to each vessel, each type of vessel, or each group of equipment types listed?

The procedures need to be specific to the type of vessel or equipment. Identical or very similar vessels and items of equipment in similar service need not have individualized maintenance procedures. Each procedure must clearly identify the equipment to which it applies.

(j)(3) Training for process maintenance activities

As OSHA indicated in the preamble, paragraph (j)(3) requires that employers provide maintenance employees with "on-going" or "continual" training adequate "to assure that they can perform their jobs in a safe manner." (See 57 Fed. Reg. 6390/1.) In this regard, the paragraph clearly contemplates that new maintenance employees be trained before beginning work at the site, and all maintenance employees receive additional training appropriate to their constantly changing job tasks.

Moreover, although "maintenance employees need not be trained in process operating procedures to the same extent as those employees who are actually involved in operating the process" (57 Fed. Reg. 6390/1), they must be trained in all "procedures applicable to the employee's job tasks to assure that the employee can perform the job tasks in a safe manner." 29 C.F.R. 1910.119(j)(3). Thus, a maintenance worker sent to work on a process breakdown must be trained in operating procedures that are relevant to the repair or installation on which he or she is working.

Finally, OSHA intends that employers incorporate all safety-related topics applicable to maintenance tasks into the ongoing training program required by paragraph (j) to assure that maintenance employees can perform their job tasks in a safe manner. Thus, in order to train maintenance workers in "procedures applicable" to their job tasks under paragraph an employer must, in appropriate circumstances, train these workers in the safe work practices required under paragraph (f)(4), in the written procedures to manage change under paragraph (l), and in the appropriate provisions of the emergency action plan under paragraph (n) of the standard. These provisions, in turn, may implicate other OSHA general industry requirements, such as, for instance, the training requirements of the lockout/tagout standard. (See 29 C.F.R. 1910.147(c)(7).

(j)(5) Equipment deficiencies

If equipment is found to be operating outside acceptable limits, must the process be shut down and the equipment deficiencies corrected before further use?

To ensure the ongoing mechanical integrity of the covered process, equipment deficiencies must be corrected promptly if the equipment is outside the acceptable limits specified in the process safety information. There may be situations where it may not be necessary that the deficiencies be corrected "before further use" as long as the deficiencies are corrected in a safe and timely manner when necessary means (e.g., protective measures and continuous monitoring) are taken to ensure safe operation.

NOTE: Operating equipment outside acceptable limits is considered to be a deficiency.

(j)(6)(ii) Quality assurance

If an installation is being done by contractors, does this require the employer to implement a quality assurance program to monitor the activities of these contractors?

The employer is responsible for ensuring that equipment is installed consistent with design specifications and manufacturer's instructions. This may require the employer to be involved in the review, inspection, certification, and quality assurance of work performed by contractors.

(l) Management of change

(l) Management of change

What does "change" encompass?

Any change whatsoever that may affect a covered process triggers the management of change provisions. The only exception to this is when there is a replacement in kind.

Do the management of change procedures apply to items such as gaskets?

Replacements in kind are not covered. If a new gasket is to be installed that is of different material, composition, shape, size, or design, then a management of change would be required.

(m) Incident investigation

(m)(5) Addressing team's findings

Paragraph (m) requires that a team of knowledgeable individuals investigate every catastrophic incident and "near-miss," and likewise requires that the employer promptly "address and resolve" the team's recommendations and document corrective action. [See 1910.119(m)(5).]

As with the similar provision in paragraph (e), this provision was designed to require the employer to respond to the team's findings and recommendations, while at the same time allowing the employer the flexibility not only to reject proposals that are erroneous or

infeasible, but also to modify a recommendation that may not be as protective as possible or may be no more protective than a less complex or expensive measure. (See 57 Fed. Reg. 6395/3.)

OSHA considers an employer to have "resolved" the team's findings and recommendations when the employer either has adopted the recommendations, or has justifiably declined to do so. Where a recommendation is rejected, the employer must communicate this to the team, and expeditiously resolve any subsequent recommendations of the team.

An employer can justifiably decline to adopt a recommendation where the employer can document, in writing and based upon adequate evidence, that one or more of the following conditions is true:

1. The analysis upon which the recommendation is based contains material factual errors;

2. The recommendation is not necessary to protect the health and safety of the employer's own employees, or the employees of contractors;

3. An alternative measure would provide a sufficient level of protection; or

4. The recommendation is infeasible.

(o) Compliance audits

(o)(1) Compliance audits--required frequency?

Employers must certify at least every 3 years that they have evaluated compliance with 1910.119. Under 1910.119(o)(1), employers must conduct compliance audits in a timely manner to meet this certification requirement. The first certification is required no later than May 26, 1995. When employers conduct compliance audits and certify compliance with 1910.119 before May 26, 1995, the subsequent certification must be within 3 years from the certification date.

NOTE: It may be necessary for employers to conduct compliance audits and certify that they have evaluated compliance more frequently than every 3 years, because of significant or numerous deficiencies disclosed by the previous audit, or for other reasons.

(o)(4) Documenting actions based on compliance audit findings

The purpose of this paragraph is to ensure that employers determine an appropriate response to each of the report findings and, if employers identify a deficiency that needs to be corrected, that they document the correction of the deficiency. The appropriate response to each of the report findings must be **promptly** documented. The correction of any identified deficiency must be documented as soon as possible after the corrective action is taken.

Appendix D

References for Compliance with the PSM Standard

1. OSHA Instruction CPL 2.45B, June 15, 1989, the Revised Field Operations Manual (FOM).

2. OSHA Instruction STP 2.22A, CH-2, January 29, 1990, State Plan Policies and Procedures Manual.

3. OSHA Instruction ADM 1-1.12B, December 29, 1989, Integrated Management Information System (IMIS) Forms Manual, Chapter

4. OSHA Instruction CPL 2.94, July 22, 1991, OSHA Response to Significant Events of Potentially Catastrophic Consequences.

5. "Safety and Health Program Management Guidelines," 1989; U.S. Department of Labor, Occupational Safety and Health Administration

6. "Safety and Health Guide for the Chemical Industry," 1986, (OSHA 3091); US.DOL, OSHA.

7. "Review of Emergency Systems," June 1988; U.S.E.P.A., Office of Solid Waste and Emergency Response, Washington, DC 20480.

8. "Guidelines for Hazard Evaluation Procedures," Center for Chemical Process Safety of the American Institute of Chemical Engineers; 345 East 47th Street, New York, NY 10017.

9. "Plant Guidelines for Technical Management of Chemical Process Safety," Center for Chemical Process Safety (CCPS) of The American Institute of Chemical Engineers (AICHE).

10. "Guidelines for Safe Storage and Handling of High Toxic Hazard Materials," AICHE, CCPS.

11. "Guidelines for Vapor Release Mitigation," AICHE, CCPS.

12. "Process Safety Management (Control of Acute Hazards)," Chemical Manufacturers Association (CMA).

13. "Evaluating Process Safety in the Chemical Industry," Chemical Manufacturers Association; 2501 M Street NW, Washington, DC 20037.

14. "Safe Warehousing of Chemicals," Chemical Manufacturers Association.

15. "A Managers Guide to Reducing Human Errors Improving Human Performance in the Chemical Industry," Chemical Manufacturers Association.

16. "Improving Owner and Contractor Safety Performance," API Recommended Practice 2220.

17. "Management of Process Hazards," American Petroleum Institute (API) Recommended Practice 750, First Edition, January 1990; 1220 L Street NW, Washington, DC 20005.

18. "Sizing, Selection, and Installation of Pressure Relieving Devices," Part 1, July 1990, API RP 520.

19. "Guide for Pressure relieving and Depressuring Systems," Nov. 1990, API RP 521.

20 "Avoiding Environmental Cracking in Amine Units," Aug. 1990, API RP 945.

21. "Pressure Vessel Inspection Code: Inspection, Rating, Repair, and Alteration," June 1989, API STD 510.

22. "Inspection of Piping, Tubing, Valves, and Fittings," API RP 574.

23. "Prevention of Brittle Fracture of Pressure Vessels," API RP 920.

24. "Accident Investigation * * * A New Approach," 1983, National Safety Council; 444 North Michigan Avenue, Chicago, IL 60611-3991.

25. "Fire & Explosion Index Hazard Classification Guide," 6th Edition, May 1987, Dow Chemical Company; Midland, Michigan 48674.

26. "Chemical Exposure Index," May 1988, Dow Chemical Co.

27. "Pressure Vessels, Section VIII," The American Society of Mechanical Engineers (ASME).

28. "Chemical Plant and Petroleum Refinery Piping," ASME B31.3.

29. "Personnel Qualification and Certification in Nondestructive Testing," American Society of Nondestructive Testing, Recommended Practice No. SNT-TC-1A.

30. "Prevention of Furnace Explosions/Implosions in Multiple Burner Boiler Furnaces," National Fire Protection Association, NFPA 85C.

31. "Purged and Pressurized Enclosures for Electrical Equipment," NFPA 496.

32. "Spacing of Facilities in Outdoor Chemical Plants," Factory Mutual Loss Prevention Data Sheet, 7-44.

33. "Chemical Process Control and Control Rooms," Factory Mutual Loss Prevention Data Sheet, 7-45.

34. "National Board Inspection Code, A Manual for Boiler and Pressure Vessel Inspectors," The National Board of Boiler and Pressure Vessel Inspectors, 1992.

35. Gideon, James A., and Thomas W. Carmody, "Process Safety Management: Resources from the American Institute of Chemical Engineers for Use by Industrial Hygienists," American Industrial Hygiene Association Journal (53), June 1992.

Additional References on Explosives Manufacture:

36. Institute of Makers of Explosives Safety Library Publications, 1120 19th Street, N.W., Suite 310, Washington, D.C. 20036:

No. 1 Construction Guide for Storage Magazines No. 2 The American Table of Distances No. 3 Suggested Code of Regulations for the Manufacture, Transportation, Storage, Sale, Possession, and Use of Explosive Materials No. 4 "Do's and Don'ts" Instructions and Warnings No. 12 Glossary of Industry Terms No. 17 Safety in the Transportation, Storage, Handling and Use of Explosives No. 20 Safety Guide for the Prevention of Radio Frequency Radiation Hazards in the Use of Electrical Blasting Caps No. 22 IME Standard for the Safe Transportation of Class C Detonators (Blasting Caps) in a Vehicle with Certain Other Explosives

37. Department of Defense (DOD) Standards:

DOD 5154.45 DOD Ammunition & Explosives Safety Standards

DOD 4145.26M DOD Contractor's Safety Manual for Ammunition, Explosives and Related Dangerous Material

38. National Fire Protection Association (NFPA) Codes:

NFPA 495 Code for the Manufacture, Transportation, Storage and Use of Explosive Materials NFPA 77 Static Electricity NFPA 78 Lightning Protection Code

Training Program References:

39. Synthetic Organic Chemical Manufacturers Association (SOCMA) Level I Chemical Process Operator Certification Training Trainee Manual, May 1990; NUS Corporation, Fossil and Industrial Training Services Department, 910 Clopper Road, Gaithersburg, MD 20877-0962.

Appendix E

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Appendix G

Recommended Guidelines for PQV Inspection Preparation (Nonmandatory)

The following guidelines are suggested as background and preparation for a PQV inspection. These are suggested actions only, and shall in no case take precedence over the guidance presented elsewhere in this instruction.

AREA OFFICE COORDINATION

Coordination within the Area Office is absolutely essential in the orderly conduct of a PQV inspection. The Area Director and all those involved in a PQV inspection must commit the resources with the understanding that the project is long-term, possibly several weeks or months. It is imperative that team members complete all outstanding assignments prior to the PQV inspection. Equally important, team participants should not be directed or "asked" to do assignments while they are engaged in the PQV inspection. An obvious exception would be court hearings, over which the Area Office has little control.

The Area Director should designate a contact person in the Area Office to coordinate and oversee all aspects of the inspection. The contact person should be a supervisor, safety or industrial hygiene (IH), who is familiar with the PQV concept. In addition to providing Area Office coordination, the contact person would review the entire case file/report. The team leader would communicate at least weekly with the contact supervisor, who would then brief the Area Director as appropriate.

INSPECTION TEAM COMPOSITION

By design, a PQV inspection is a large and complex undertaking, to be accomplished by a select, well-trained team. All members of the team must be experienced journey or senior level compliance officers who are familiar with the chemical industry and have taken the appropriate OSHA training. Newer compliance officers can be utilized in the inspections, but not as a substitute for regular team members.

The team should consist of two safety compliance officers/engineers, two industrial hygiene compliance officers, an administrative support person and a construction specialist. The team leader could be from either discipline in the team, but preferably a safety specialist, due to the fact that most of the critical PSM and construction related hazards reside in the area of safety.

The team leader should be a GS-12 Senior Compliance Officer with experience in large team inspections. He or she should have excellent organizational and communication skills, both oral and written. It would also be of benefit that the team leader be knowledgeable in word processing and data base management computer operations. Since the team leader will be the focal point during the conduct of the inspection, that person should also have demonstrated leadership abilities. The entire team, the company, employees/unions and other OSHA personnel will look to the team leader for direction and answers to the many questions that will arise during the course of the inspection.

The team leader is responsible for the overall conduct of the inspection including planning, onsite activities and report preparation. The leader would assign the various inspection areas to team members in accordance with their expertise and abilities, and determine what, if any, special expertise is needed. Additional responsibilities include:

1. Keeping the Area Office contact apprised of activities; 2. Providing and tracking requests for documents; 3. Resolving problems with the company; 4. Ensuring that the report addresses all questions in the directive.

An administrative support person would greatly increase the overall efficiency of the inspection. This position would be ideal for an accommodated compliance officer with some computer skills and organizational abilities. The support person would answer directly to the team leader and would be responsible for organizing, labeling and filing the many documents that will become part of the case file. An accommodated CSHO could also review the documents and document requests to assure the request was properly fulfilled. In addition, an accommodated CSHO could assist the inspecting team members with the many interviews that will be conducted. The support person would also be responsible for the inspection supplies and equipment.

Safety and IH team members are responsible for carrying out the PQV inspection activities under the direction of the team leader. They must keep the team leader apprised of their activities and potential problems when they arise. The construction specialist would work for the most part independently of the rest of the team, under the general direction of the team leader. Some crossover of inspection areas is to be expected, as many of the contractors and company responsibilities overlap.

PRE-INSPECTION PREPARATION

Effective planning and preparation is essential to the efficient implementation and successful completion of any large inspection, especially a PQV. Exhibit 1 provides an outline that can be used as a guide to plan and prepare for a PQV inspection. Establishment histories can be obtained and reviewed well in advance of the target date for the inspection. The inspection strategy and scheduling should be done after the team has been selected. A pre-inspection meeting with all members and the Area Office contact person should be held prior to entry.

The case file begins in the planning and preparation stage. Any documents received, such as micro to host reports, citations and PSM-related findings (including PetroSEP) in other

regions must be logged and identified to allow for easy retrieval. An activity log/diary should be started to record all pertinent actions taken. A computer data base management program is recommended to keep track of the document requests and to provide a ready index of the documents that have been obtained. With this type of system it would be easy to search for pertinent documents by using the OSHA identification number, topic of document, company identification number, date of request, etc., and to ensure that various members of the team do not duplicate requests for documents.

The team should develop a weekly schedule of activities, taking into account travel days, holidays, start time, stop time, company briefings and internal briefings. Time should be allotted during the inspection week to complete necessary paperwork and documentation and tie up loose ends.

DOCUMENTS

PQV inspections will require compliance officers to review numerous company documents. Many of these documents will become part of the case file as documentation for potential citations or for documentation of the required PSM elements. It is imperative that these documents be organized and identified so that they may be readily referenced and reviewed. It is highly recommended that all requests for copies of company documents be in writing. A standard document request format should be established and should contain at least the following information:

1. Who is the requester 2. To whom the request is made 3. Identity of the document (in company terms if possible) 4. Company document number 5. Date of request 6. Priority for response 7. Internal I.D. number or docket number (for filing) 8. Date request fulfilled 9. Comment section (did the response fulfill request).

It should be noted that there is no universal language used to identify documents. Different companies have different names for the same type of document. It is therefore essential to clearly communicate what information is needed and desired prior to writing the request. The document requests should be in duplicate: one copy for the company and the other to be retained in the case file. To avoid long discussions and legal department involvement, all documents obtained should be considered proprietary information.

Prior to the documents actually being received, a filing system should be developed. The system should be secure, accessible to all team members and ensure that individual documents are easily retrievable. The administrative support person could manage the filing system to ensure its continued effectiveness. NOTE: Only appropriate documents should be maintained in the filing system; field notes, document "clips", and document review/evaluation notes should remain with the corresponding 1B's.

Exhibit 2 contains a list of those documents most commonly requested. It is divided into two sections: Pre-Unit Selection and Unit-Specific Documents.

INSPECTION FACILITIES

The PQV team needs a suitable work area/command center from which the inspection can be conducted and coordinated. Except in the most unusual of circumstances, the company will provide the requisite onsite space. Almost any room will suffice, providing it meets some basic requirements. The work area must be secure 24 hours a day with access limited to the inspection team and those company officials who would respond in an emergency. This is important so as to preclude taking boxes of documents and equipment in and out each day. The room should have sufficient desks and/or tables for reviewing documents and writing the report. Provisions should be made for communications--one phone line as a minimum. Outgoing calls should be charged on the Area Office calling card. Where phone service is not provided, the team should have a portable cellular phone. Sufficient power outlets should be available for charging pumps, batteries and other inspection equipment.

The inspection team will need copies of a number of documents. It is hoped that the company would provide copying services or the use of a copy machine. The administrative support person could make the copies should the company not provide these services.

The team leader must determine as soon as possible, what--if any--of the necessary facilities the company will provide. If the company does not provide all of the necessary facilities voluntarily, or puts disruptive restrictions on their use, the ARA for Technical Support should be contacted as soon as possible so that alternate facilities can be arranged. This may result in the use of a rented copier(s) and office space.

INSPECTION EQUIPMENT

Upon entry to the site, the inspection team should be fully prepared with all necessary inspection equipment and personal protective equipment. Exhibit 3 contains a list of equipment that may be useful to prepare for the inspection. In addition, an inspection "kit" is outlined which can be used to set up the command center. Some of the items in the "kit" may appear to be trivial; however, all of these items will be needed at some time during the inspection. It may not be practical to go back and forth to the office or a store to get these items, particularly if the inspection site is in a remote location. The administrative support person would be responsible for maintaining adequate supplies throughout the inspection.

CRITICAL INSPECTION AREAS

It is essential that team members have specific subjects and areas to investigate. The team leader, with input from the team members, should assign the inspection areas prior to entry. This will help to avoid confusion and duplication of effort. In addition, the team members will be able to be better prepared for their individual tasks.

As inspection subjects are completed, the information should be reviewed with the team leader before going on to the next assignment. The state of compliance or noncompliance

within any given area may require the team leader to modify the assignment list so as to make the most of the resources available.

CONTRACTORS

Contractors are an integral part of any PSM inspection. There may be only a few contractors or dozens, with several hundred contract employees, depending on whether the facility is undergoing a shutdown or turnaround.

It is imperative that, upon entry, the scope of the contractor activity be determined. The construction specialist on the team will have to formulate an inspection plan and set appropriate priorities. It is not the intent of the PQV inspection to inspect all outside contractors that are on-site, rather to inspect only those contractors who may be exposed to, or could cause or be affected by a catastrophic incident. Food service workers, certain janitorial employees and similar activities would not normally be inspected. Remote construction projects not associated with catastrophic potential would not necessarily be inspected.

The term "contractor" is not limited to construction type activities. Many chemical facilities use contract maintenance workers, vessel and piping inspectors, vessel heat treating, cleaning, engineering and similar non-construction contractors who remain at the facility year round or are called in at regular intervals. They are used to supplement existing plant personnel for regular duties and for special projects.

A shared responsibility for both contractors and company is quality assurance. It is essential that all materials and workmanship meet engineering standards. There should be sufficient checks to ensure that materials, such as the proper alloy or carbon steel pipe is used, and that the studs and/or bolts are of the proper size and grade. This is especially important in contractor supplied materials.

CRITICAL EXPERTISE

Situations may arise in a PQV inspection that are beyond the technical expertise of the team members. A list should be developed identifying OSHA personnel and/or private sector experts and how they may be contacted. Areas where this expertise may be needed are:

1. Pressure equipment 2. Fire protection (fire brigades) 3. Facility siting 4. Emergency medical services 5. Hazardous waste operations 6. Dispersion modeling & incident command centers 7. Process hazard analysis/HAZOPS 8. Process chemistry 9. Industry practice

By no means is this list all-inclusive. It should be modified as needed to reflect current technology and hazards.

DOCUMENTATION

In order to withstand the probable legal challenges, all items must be thoroughly documented. Since the team will be made up of journey-and senior-level CSHOs, good documentation is to be expected. All OSHA-1B forms must be complete and legible. Shortcuts for employer knowledge such as "should have known" or "reasonable diligence" are not acceptable. Appropriate company documents, logs, procedures, permits, etc., should be referenced on the 1B for the particular violation.

Photographic documentation, either still camera or videotape, should be reviewed as soon as practicable to ensure that the condition or violation is appropriately depicted. Retake any photos or videos that are not good quality.

CASE FILE AND REPORT PREPARATION

A PQV inspection will take weeks or months of onsite activity and will generate a large amount of paper, both in field notes and documents. It is essential that the paper flow be organized and well maintained. This will result not only in a more efficient onsite survey, but will greatly reduce the write-up time.

A daily log, either manual or computer generated, should be maintained indicating the team members onsite, daily activities, meetings, problems, or other details, as necessary. All OSHA-1B forms should be completed as the violation is observed, documenting the employees exposed, the date, time, location and management representative who accompanied the CSHO. Each instance of a violation should have a separate 1B. Where multiple violations are noted on a form, the form should be photocopied and highlighted showing the appropriate instance and corresponding documentation. Alleged violation descriptions should be written as soon as practicable, while the hazard is fresh in the mind of the CSHO. Multi-employer policy citations must be coordinated with respect to exposing, controlling, correcting and creating employers' files.

Case file structure and organization must begin prior to entry into the facility. All documents must be logged and an index (computer preferred) generated, indicating the subject matter, document identification number, file number and the location of the document (box number). This is essential, as these documents may have to be referenced or retrieved many times during the course of the inspection and the review process. A data base management program for the PC's would be extremely beneficial. Computer disks should be backed up daily, or more often as necessary. The photos and videotape taken during the inspection should be properly identified with photographer, date, roll or tape number and subject. They should be kept in a separate file.

EXHIBIT 1

PRE-INSPECTION PREPARATION

A. Previous OSHA history - nationwide search

1. all citations and/or reports 2. litigation results 3. outstanding issues, items in contest 4. health response team reports 5. NIOSH evaluations if any

B. EPA history 1. reportable releases 2. reports of any kind 3. complaints and pending actions

C. Other Agency histories - local/State/Federal

1. Dept. of Transportation 2. Coast Guard 3. ESDA/FEMA 4. State Fire Marshal 5. State Boiler and Pressure Vessel

D. Previous PetroSEP/PSM inspection results

1. citations 2. team members & expertise 3. settlement agreements or litigation results

E. Identify contact people -- other jurisdictions

o EPA, DOT, Coast Guard, etc.

F. Acquire necessary codes or standards

o ASME, API, ANSI, NFPA, etc.

INSPECTION STRATEGY

A. Identify critical needs and expertise

B. Select team members

C. Identify expertise within the team

D. Identify critical inspection areas

E. Assign areas according to expertise

F. Identify areas lacking expertise

1. provide training 2. bring in additional resources

G. Develop a tracking system for documents

H. Develop a daily log of on-site activities

I. Identify known scheduling conflicts

o Team members and/or employer

J. Develop weekly schedule of activities

1. travel, write up, start/stop times 2. employer/employee and Area Office updates

PLANNING AND SCHEDULING

A. Create a Projected Time Line

1. Projected records and program review time 2. Projected walkaround time 3. Projected write-up time

B. Resource Scheduling

1. Team leader and construction specialist enter first for program and records review; present document request list. 2. Full team enters following acquisition of requested documents for program/record review & walkaround 3. Expert assistance enters as needed

C. Equipment Acquisition

1. Required PPE 2. Technical equipment

EXHIBIT 2

DOCUMENT REQUEST LIST

I. **PRE-UNIT-SELECTION**

A. OSHA 200 logs for past 3 years

1. Employer 2. Contractors

B. Incident reports

1. Near miss 2. Fires 3. All releases (cross check with EPA documents)

C. Site plan/Facility overview

D. Simplified flow diagrams

E. All permit procedures

1. Confined space 2. Hot work 3. Others

F. Hazard communication

G. Overall emergency response plan (emergency action plan, evacuation plan)

H. Lockout/Tagout

I. PPE plan/Requirements

J. Audits

1. Internal 2. Corporate 3. Contracted 4. Insurance/Consultant

K. Fire brigade records

1. Organizational statement 2. Training records 3. Callouts/Responses 4. Roster 5. Equipment inspection

L. Respirator program and inspections (emergency use)

M. Infection/Exposure control program (bloodborne)

N. Safety and health outline

1. Minutes of safety and health committee meetings and walkaround reports 2. Committee roster

O. Disaster preparedness program

P. Facility description

1. Size, capacity, age (units) 2. History

Q. Turnaround/Shutdown schedule (not turnaround plan)

R. Safety and health complaints

S. Accident investigation logs

T. Industry hazard alerts (fire and explosion information from other facilities) ("Lessons Learned" by API)

U. Process hazard analysis scheduling procedure

II. **UNIT-SPECIFIC DOCUMENTS**

A. Written operating procedures

1. All current procedures a. Normal b. Abnormal c. Emergency

2. Startup procedures a. Partial (swoop down procedures) b. Full (cold)

3. Shutdown procedures a. Normal b. Emergency

4. Upset conditions (beyond normal operating parameters)

B. Process safety information

1. Process chemistry

2. Capacity (volume)

3. Operating temperatures and pressures

o Alarm settings (high, high-high, low, low-low, etc.)

4. Operating parameters

5. Consequences of deviations

6. Flow rates

C. Operating logs (past 6 months)

1. Foreman

2. Operator

3. Manual and Computer

D. Piping and instrumentation diagrams (P&IDS)

1. Working (unit level) **NOTE: Must be current**.

2. Archival

3. Simplified (detailed, at a later date)

4. Product

5. Utility

6. Fire protection

E. Training records

1. Operator and supervisory

2. Training records (summary) for all safety and health programs

a. Hazard communication b. Emergency response c. Bloodborne d. Respirators and PPE e. SCBA f. Fire g. Others

F. Permits for the units

o Hot work, confined space, etc.

G. Pressure vessel records

1. For at least 20 different vessels, selection based on age, pressure, temperature, toxic chemical involved (corrosive nature,i.e. sulfuric acid), repair history, environmental stress cracking, etc.

2. Inspection records

a. All previous records b. Analysis of defects c. Nondestructive testing records d. Inspection schedule and frequency e. Internal f. External g. On-stream h. Special i. U-1 and U-2 records

3. Inspector qualifications

a. ASNT or equivalent levels (1, 2, or 3) b. Roster of inspectors c. Training history and documentation

4. Pressure relief valve (PRV) inspection records

5. Selection criteria for PRV's, vessels, etc.

H. Unit plot plan - detailed

I. Instrumentation calibration records

J. Unit emergency response / Action plan

K. Control room blueprint and schematic

L. Work orders

1. Outstanding

2. Obtain a sample of completed work order

3. Written work order procedure

4. All safety work orders

M. Environmental sampling records

1. Noise

2. Air contaminants/Toxins

3. Asbestos

N. Product sampling procedures

O. Calibration records for IH sampling equipment

P. Pre-startup review

Q. Rotating equipment inspection records

1. Schedule

2. Repair records

R. Operator certification

S. Flare system diagram (P&ID)

T. Process hazard analysis (Haz-Op, What-If, etc.)

U. Piping inspection program

1. Records/Results

2. Schedule

3. Inspector qualifications

EXHIBIT 3

INSPECTION EQUIPMENT

I. PERSONAL PROTECTIVE EQUIPMENT

A. Standard PPE per directive

1. Safety shoes 2. Safety glasses with side shields 3. Hard hat

B. Site specific PPE

1. Hearing protection 2. Respirators with proper filters/cartridges

C. Flame retardant clothing/coveralls

D. Emergency escape packs, where necessary

E. Supplied-air respirators (only trained CSHOs)

F. Oxygen and combustible meters

II. SAMPLING EQUIPMENT

A. Hydrogen sulfide dataloggers/dosimeters

B. Noise dosimeters

C. Benzene equipment/media

D. Sulfuric acid/hydrogen fluoride equipment/media

E. Asbestos media

F. Other air contaminants

G. Charging facilities (area and equipment)

H. TSD sites - specific requirements

III. TECHNICAL EQUIPMENT

A. Cameras and video cameras

1. Company policy regarding use 2. Each CSHO/inspection team equipped with a camera 3. Careful log of each frame (who, when, where, what)

B. FILM

1. Each roll should be identified with CSHO, date, and time prior to developing 2. Each picture identified with CSHO, date, and time 3. Film must be developed as soon as possible, and identified (who, what, where, when) 4. Film log must be maintained with roll number, CSHO, date in for developing, date returned 5. Photos should be mounted on worksheets and identified sequentially for each team member 6. Negatives must be identified and secured (preferably stored separately from developed photographs)

C. Videotapes

1. Identified with CSHO, date, and subject 2. Original tapes must be maintained 3. Videotape log maintained with CSHO, camera number (serial number), and date

D. Audiotapes

1. Primarily for interviews and/or field notes 2. Company policy 3. Permit requirements 4. Original tapes must be retained in file 5. Transcription (as needed) 6. Tapes must be identified with date, team member, and subject matter 7. Tapes must be logged

INSPECTION KIT

I. Office Supplies

A. Folders (file folders and expandable) B. Paper clips C. Hole punch D. Stapler and staples E. Staple puller F. White out/correction tape G. Colored pencils/markers H. Scissors I. Post-its J. Tape K. Labels L. Pens/pencils M. Calculator N. Ruler/graph paper O. Filing Boxes P. Envelopes

II. Inspection Supplies

A. OSHA forms (1b, photo mounting, 5(a)(1) letters, willful and 5(a)(1) worksheets)

B. Film, audio and video tapes

C. Batteries and battery packs for camcorders

D. Film processing envelopes

E. Sampling media

1. smoke tubes 2. scintillation vials 3. filters/charcoal tubes

F. OSHA 31's & travel vouchers

III. Command Center Equipment

A. Computers (two or more)

1. database management program 2. word processor 3. spreadsheet 4. floppy disks

B. Printer with paper and spare ribbon

C. Disk storage boxes

D. Fax with extra paper

E. Cellular phone and pagers if needed

F. Chargers for all equipment

G. Answering machine

H. Telephone directory (OSHA contacts)

IV. Library/Reference Material

A. API 510, 750, and others

B. PUB 8-1.5, CPL2 PETROSEP (March 9, 1992)

C. 1910.119 Process Safety Management

D. OTI-PSM (Courses 330/340) manuals

E. 2 sets General Industry and Construction Standards

F. SAVEs manual

G. Field Operations Manual

H. Other references as needed; e.g., NFPA, ANSI, ASNT

APPENDIX H

Recording PSM-Related Inspection in IMIS

Information about PSM-related inspection activity, as described at H. of this instruction, shall be recorded in IMIS following current instructions in the IMIS manual. These guidelines shall apply:

1. **PQV Inspections**. The identifier code "PSMPQV" shall be used for these inspections.

a. PQV inspections, as described at J., K., and L. of this instruction, shall be identified by recording "PSMPQV" in item 25.d of the OSHA-1 Form.

b. Any inspections of onsite contractors shall also be identified by recording "PSMPQV" in item 25.d of the OSHA-1 Form.

c. Linkage of all of the employers inspected on-site shall be performed in accordance with the instructions for entering **Multi-Employer Inspections** currently specified in Chapter V, item E.(5.), of the IMIS Forms Manual.

d. PQV inspections may be programmed or unprogrammed; all PQV inspections shall be identified as comprehensive.

2. **Unprogrammed PSM-related Inspections**. All unprogrammed inspection activity relating to the PSM standard--as described at H.3. of this instruction--shall be coded as follows in Item 42, Optional Information of the OSHA-1 form:

TYPE ID VALUE

N 06 PSMP

This shall apply to all unprogrammed inspections in which compliance with the PSM standard is investigated; i.e., inspections in which the establishment:

a. Is not in one of the SIC codes listed in Appendix C of this instruction; or

b. Is not an establishment selected for a PQV inspection, although it is in one of the SIC codes listed in Appendix C of this instruction.

3. **Other Programmed Inspections: Screening for PSM Coverage**. In all programmed safety and health inspections in general industry, a determination shall be made as to whether the establishment is covered by the PSM standard. The establishments shall be coded as follows in Item 42, Optional Information of the OSHA-1 form:

a. Establishments determined to be covered by the PSM standard:

TYPE ID VALUE

N 06 PSMY

b. Establishments determined to be NOT covered by the PSM standard:

TYPE ID VALUE

N 06 PSMN